

SECOM 737_{CE}



User Manual

Version 1.94/01

User - Manual

SECOM 737CE

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SETEX

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EG declaration of conformity for the CE marking

Product (s)	Industrial PC SECOM 737CE
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If used as directed the indicated product is in line with the regulation of the following European Directives:

93/68/EWG	Directive for CE Marking
89/336/EWG	Directive for Electromagnetic Compatibility (EMC)
73/23/EWG	Low Voltage Directive (LVD)

The conformity of the indicated product with the regulations of the above-mentioned directives is proven by the compliance with the following harmonised standards:

Emitted Interference:	DIN EN 55022 (09/03), DIN EN 61000-6-4 (08/02)
Interference resistance:	DIN EN 61000-6-2 (08/02)
Security:	DIN EN 60950-1 (03/03)

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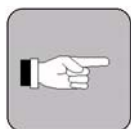


Safety advices



General notice

Several icons are used in this manual to point out warnings, possible errors and hints. The icons have the following meanings:



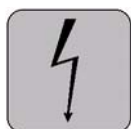
Reference

This icon is used for general references.



Attention

Parts in the manual marked with this symbol refer to possible error conditions or dangerous situations that might occur when working with the controller.



Warning

This symbol is used to point out dangers for the user's health.



Safety advices



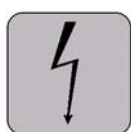
The operating instructions should be read carefully before installing and setting the controller into operation. Wrong handling can lead to injuries and/or damages of equipment.



The proper and safe function of the controllers requires a correct transport and storage of the equipment as well as a professional installation and maintenance.



In principle, electronic appliances are not fail-safe. The user must take care that the machine is in a safe mode if a failure on the controller occurs. Otherwise, this could cause injuries to persons or damages to the equipment



When opening covers or removing parts from the controller, parts connected to the supply voltage may be uncovered and could be touched. Before working on it or exchanging parts of the controller, if it becomes necessary to open the controller's housing, the controller must be disconnected from power. Repairs of the controller which have to be done while the housing is open while power is applied to the controller, this must only be done by trained and qualified personnel..



If one can assume that a safe operation is no longer possible, the appliance must be switched off. Make sure that it cannot be switched on accidentally in this case.

It can be assumed that a safe operation is no longer possible in the following conditions,

- If there are visible damages on the controller,
- If the controller does not work,
- If the controller has been stored under inadequate conditions for a longer period of time,
- After unsuitable transportation conditions.



Safety advices



1. General information

During operation, the SECOM controllers might have – corresponding to their protection class – parts with live voltages, hot surfaces or eventually moving parts.

There is a risk of injuries to persons and damages of the equipment if the protective covers are opened, if the controller is not properly installed or when operating errors occur.

You will find more information on this subject in the documentation.

All work in regard to the transport, the installation, the setting into operation and the maintenance should be done by authorized and qualified personnel only (the relevant IEC-, DIN-, VDE- and national regulations for prevention of accidents and electrical hazards must be observed).

Qualified personnel in this sense are persons who are familiar with the installation, the mounting, the setting into operation and the operation of the controller and who possess the qualifications related to their profession.

2. Use of the controllers

The SECOM controllers are electrical equipment for the installation in control cabinets of electrical facilities or machines.

Please find the technical data and the information on the connection of the controller in the documentation. These instructions must strictly be observed.

3. Transport, storage

Please observe the advice for the transport, the storage and the proper handling of the controllers.

4. Installation

The installation and measures for adequate air ventilation of the controllers must be done in accordance with the instructions in the related documentation.

Make sure that no components are bend during transport and handling. Avoid touching the electrical components and contacts.



Safety advices



5. Electrical connection

The electrical installation has to be done according to the relevant regulations (e. g. wire cross section, fuse protection, protective conductor connection etc.). Advice about this matter is included in the documentation.

6. Operation

Production facilities with integrated computer controllers must be equipped in certain cases with additional supervising and protective equipment in accordance with the relevant safety regulations, regulations for prevention of accidents, etc.

The machine construction must include measures limiting the consequences of a malfunction or a damage of the controller in order to avoid injuries to persons or damages to the equipment.

All covers and doors must be shut during the operation.



These safety instructions must be kept!

Please observe also the specific safety instructions and the operating instructions.

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1 General information

Features

The program controller SECOM is an industrial PC designed and developed for applications in the textile-finishing field.

The most important feature for the operator is the graphical user interface using Windows CE. It allows the user to get acquainted with the system in a fast and comfortable way.

The SECOM can be used as a single program controller as well as in a PC network.

Application

The main field of operation for the SECOM is the automation of all discontinuous, program-controlled processes in a dye house.

Due to its flexibility and the possibility to be adapted to various systems, the program controller can be applied to all production and laboratory facilities of wet finishing, like e. g:

Jet
Jigger
Beam machine
Yarn machine
Foulard

Safety concept

Programs installed on the SECOM can be saved on a USB memory stick and can be transferred to other machines or, if necessary, copied back to the controller.

The important machine related information stored on the SECOM like:

- Machine functions
- Configuration

are saved on a CompactFlash disk which is plugged into the SECOM.

The safety concept of the controller includes a power-fail recognition, which ensures that the SECOM will be in a safe mode in case of power failure.

After restarting the controller the SECOM automatically returns to the interrupted program step and can be restarted at that point.

Alarm processing

Failures that occur during the operation of the SECOM are announced by a displayed text and are recorded at the same time.

Depending on the severity of the failure, the alarms may stop or interrupt the running process.

There are different alarms announcing different failures:

- Machine specific alarms
- System alarms of SECOM
- System alarms of the connected PLCs

2 Operation

Due to the various possibilities offered by a PC based controller, the operation of the SECOM is very easy and is achieved by using only a few operating elements.

At the bottom of the screen the current available functions of the 4 function keys (F1 to F4) are displayed.

Below the function keys you can find additional keys, so-called "Hot-Keys". They are used to open certain windows directly or to start certain actions.

Further below to the left there is the numerical keyboard. To the right you find keys to start and stop the controller, cursor keys, page-up and page-down keys as well as ESC, Alt, backspace and OK (Enter) keys which functions are similar to those on a normal PC.

On the left side of the SECOM you will find a USB port that can be used for USB memory sticks, keyboards etc. A cover closes it.

SECOM 737CE



Picture 2-1:
Front view

USB connector

2.1 Operating elements

2.1.1 Program function keys

The keys F1 to F4 are **not** fixed assigned to special program functions.

Picture 2-2: Example program- function key line



The current functions of each of these four keys are displayed in the lower part of the screen (function key line).

2.1.2 Special function keys / Hot keys (with LED)

Picture 2-3: Special function keys (Hot Keys)



With the help of the special function keys it is possible to open certain windows directly or to start certain program actions.

2.1.2.1 Lock key

Setting up different authorization level can restrict the access to different operations, like e.g. program editor, manual operation or the configuration menu.



To get access to the different authorization levels, a pass-code must be entered after pressing the lock key.

After the lock key is pressed, a window is displayed in which the pass-code has to be entered.

After having entered the **numeric code (max. 8 digits)** and after having confirmed the input with the **OK key**, the window will be closed and access to the corresponding level is granted.

The code entered is displayed as *********.

A yellow LED in the lock key indicates that the program lock has been opened.



Picture 2-4: Window for pass-code input

In case you do not wish to enter a pass-code, the window can be closed by pressing the **Esc key**.

If the lock key is pressed again, the access rights to the selected level will be removed.

The yellow LED is switched off.

In case that a wrong pass-code has been entered the following message will be shown.



Picture 2-5: Wrong code

After pressing the **OK key**, this window will be closed and the pass-code can be entered again.

2.1.2.2 Alarm key



The red LED **is flashing** when a **stop alarm** occurs.

The red LED **is on** when an **info alarm** or a **hold alarm** occurs.

Press the alarm key to close the alarm window and to quit the alarm.

See also chapter 5, item 15.1 Alarm display, on page 5-106.

If the alarm key is pressed in the main or in a selection menu, the alarm list will be displayed (this is the Hot key for the alarm list of the info menu).

See also chapter 4, item 14.2 Alarm list, on page 4 -93.

2.1.2.3 Operator call key



The yellow LED **is flashing** when an operator call occurs.

This key has different functions depending on the current controller mode:

- If the operator call window is active:

The operator call will be confirmed.

- If a function stop (like e. g. load/unload, chemicals, color, sample) is active:

The function or the step is confirmed, provided that the step confirmation has been initiated and the system constant no. 47 "**mode operator call key**" is set to **1**.

- If the controller is in any other state like than the two described above and if it is in the main menu, in a selection menu or in the alarm list:

The process picture No. 9 will be displayed provided that it has been configured. As per definition, this process picture should contain time- and batch information for the operator.

(see chapter 4, Picture 14-3, on page 4-93)

2.1.2.4 Addition key

The yellow LED **is flashing** if the controller is in "RUN" mode and in function "SAMPLE", and provided that the addition selection has been enabled.



The yellow LED **is on** while the **addition** function is running (if the addition is finished it jumps back to the sample step it came from) and is switched off as soon as the sample function has been confirmed.

This key has different functions depending on the current controller mode:

- If the operator call window is active:

The operator call will be confirmed.

- Function "Sample" is active:

When pressing the addition key, the window for the addition selection will be displayed (this is the Hot key for the addition selection).

See also chapter 3, item 11.4.1.2 An addition is required, on page 3-82.

If the system constant 28, addition key, is set to 1 and the controller is in any other state as mentioned above, then the extended program list will be shown if the button is pressed.

2.1.2.5 Manual operation key

During **manual operation**, the yellow LED **is flashing**.



After pressing this key, the window with the manual operation editor will be displayed (this is the Hot key for manual operation).

See also chapter 3, item 11.3.1 Manual intervention , on page 3-77.

2.1.3 Start-key



Press the **green** start key to start a selected program or to continue an interrupted program.

"RUN" is displayed in the status line and the green LED is on.

2.1.4 Stop-key

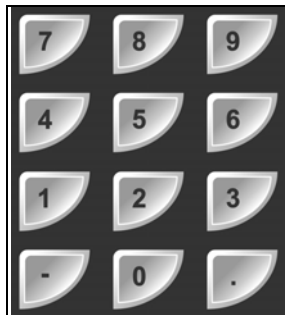


Press the **red** stop key to interrupt the running program.

"BREAK" is displayed in the status line. The green start key LED is off.

2.1.5 Numeric keypad

Picture 2-6: Numeric keypad

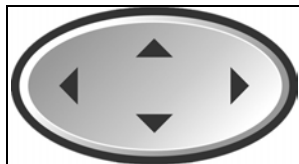


The numeric keys are used to enter the numbers when editing programs.

The numeric keys can also be used as a shortcut to select function groups and functions during programming as well as to open an info window of the parallel functions from the main menu.

2.1.6 Cursor keys

Picture 2-7: Cursor keys



The cursor keys are used to select an element in a selection window.

Within a list window, these keys are used to scroll up or down line by line.

If the main window is shown and the controller is in the "STOP" state then the cursor keys can be used to scroll through the program step by step.

2.1.7 Other function keys

Esc-key

Press the "Esc" key to cancel your entries or to close open windows.



Backspace (delete) key

In an active input field, characters and numbers can be deleted one by one by pressing the "Backspace" key.



Alt-key

This key is used to open various windows.



OK key

This key has the same function as "Enter" key of a standard PC.



Any input into a programmable field has to be confirmed by pressing **OK**.

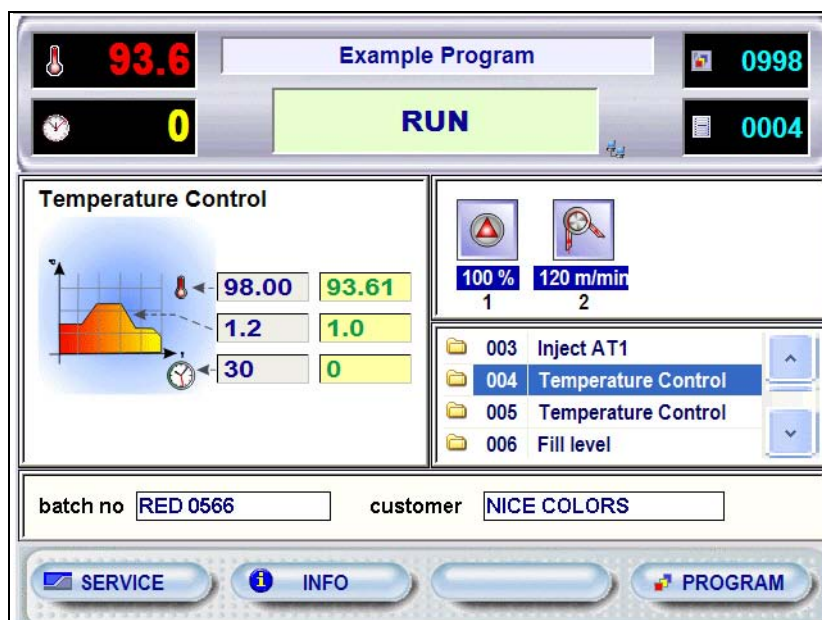
If you are in a selection or list window you have to press the **OK key** to confirm the selection made with the cursor keys.

2.2 Display

The LCD-screen works in VGA mode with a resolution 640x480 pixel and 256 colors.

2.2.1 Display layout

Picture 2-8: Main menu



The display content is composed from a status line, function key information and areas for the function display, step list and batch process information.

Depending on the situation additional windows will be opened and messages will be shown. Also the operator can open other pictures, lists and information windows.

2.2.1.1 Status-line

Picture 2-9: Example Status line



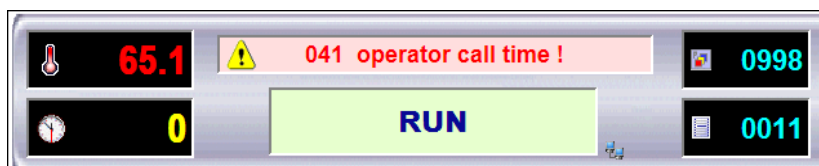
This line includes the following information from left to right:

- Temperature symbol (can also be configured to show other symbols/icons)
- Actual temperature value of the main tank (can also be configured to show other values)
- Time symbol (can also be configured to show other symbols/icons)
- Remaining time for the current main function if applicable (can also be configured to show other values)

- Program name of the actual running program or alarm number and total number of all active alarms (if any)
- Status of the controller/dye process
- Program No. of the actual running or of the last running program
- Actual program-step number

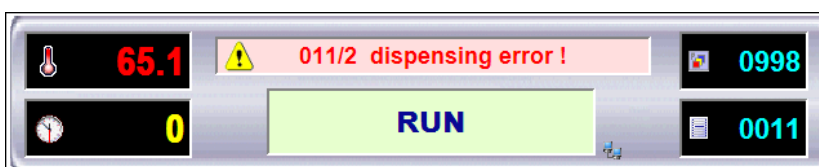
If an alarm is active the alarm number will be shown.

Alarm display



Picture 2-10:
Example Alarm
display

If more than one alarm is active, the alarm number with the highest priority will be displayed and the total number of all active alarms is shown.



Picture 2-11:
Example Alarm
display

2.2.1.2 Program status

The controller can be in one of the following states:

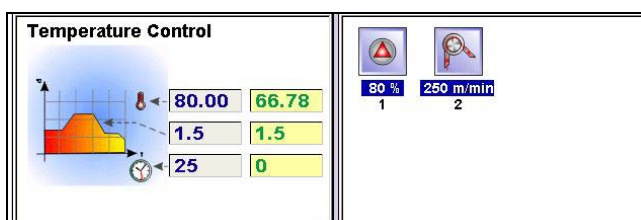
- SELECT ⇒ No batch (program) has been selected
- READY ⇒ A batch (program) is selected but has not been started yet
- RUN ⇒ A batch (program) is running
- BREAK ⇒ A batch (program) is interrupted (by stop key or stop alarm)
- END ⇒ A batch (program) has been finished
- HOLD ⇒ A batch (program) is on hold (hold alarm)
- INTERVENT ⇒ Manual intervention is active
- MANUAL ⇒ Manual operation mode is active, controller in STOP mode
- MAN ACTIVE ⇒ Manual operation mode is active, controller in RUN mode

2.2.1.3 Process information

The middle part of the screen shows information about the actual running program respectively of the actual running batch and of the dye process in general. This part of the screen is divided into four sections.

The upper left section shows the active main and parallel functions with the related icons. For the main function the function set and actual parameters are shown. For the parallel functions the set values are shown. By pressing the related numerical key a window is opened that shows the set as well as the actual parameters of the parallel functions.

Picture 2-12:
Function display,
main and parallel
functions



The middle right section shows the step list of the dye program from the actual batch. The actual processed step is marked with a blue line. Selecting the program list with the cursor keys followed by the **OK key** will open a larger, more detailed list screen.

Picture 2-13:
Display of the step
list, step 3 is active

002	Inject AT1	
003	Temperature Control	▲
004	Temperature Control	
005	Fill level	▼

2.2.1.4 Batch information window

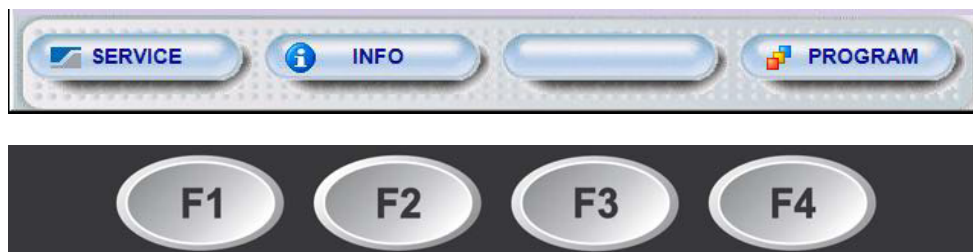
The batch information window can optionally be configured to show batch information, time information and process information etc. of the actual running batch.

Picture 2-14: Batch
information window

batch no	RED 0566	customer	NICE COLORS
----------	----------	----------	-------------

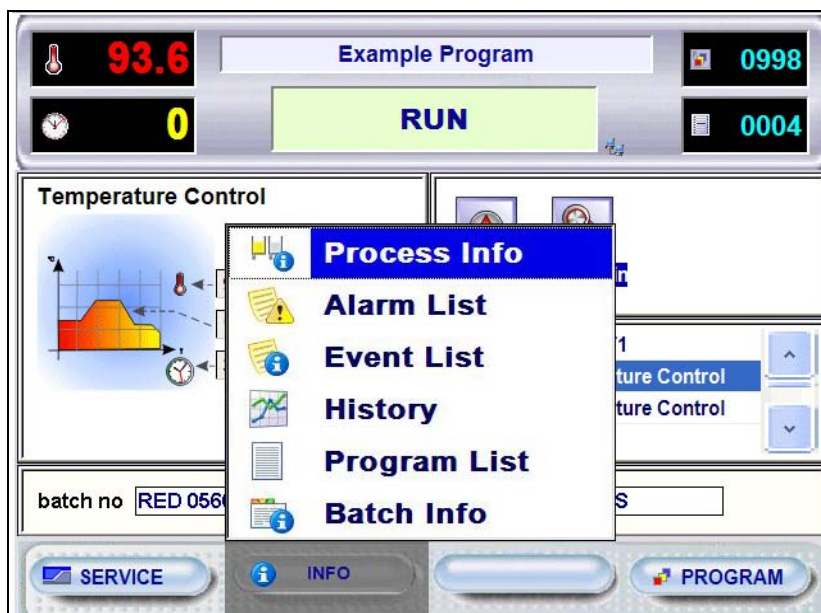
2.2.1.5 Program function key line

Located in the lower part of the screen is the function key line. Via the keys certain program functions can be started or menus can be opened.



Picture 2-15: Example program function key line

The actual valid function for the keys F1...F4 is displayed program controlled in the function key line.

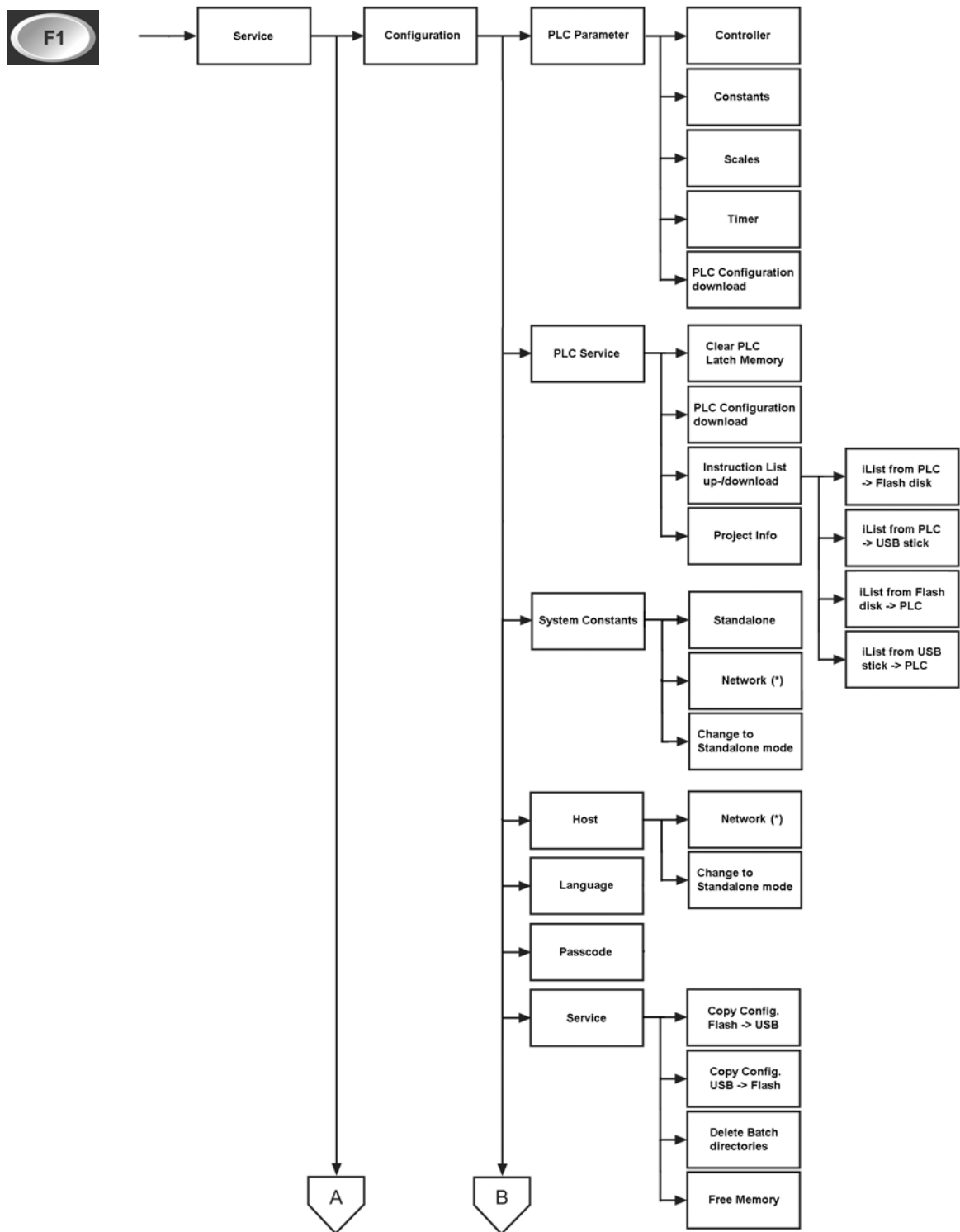


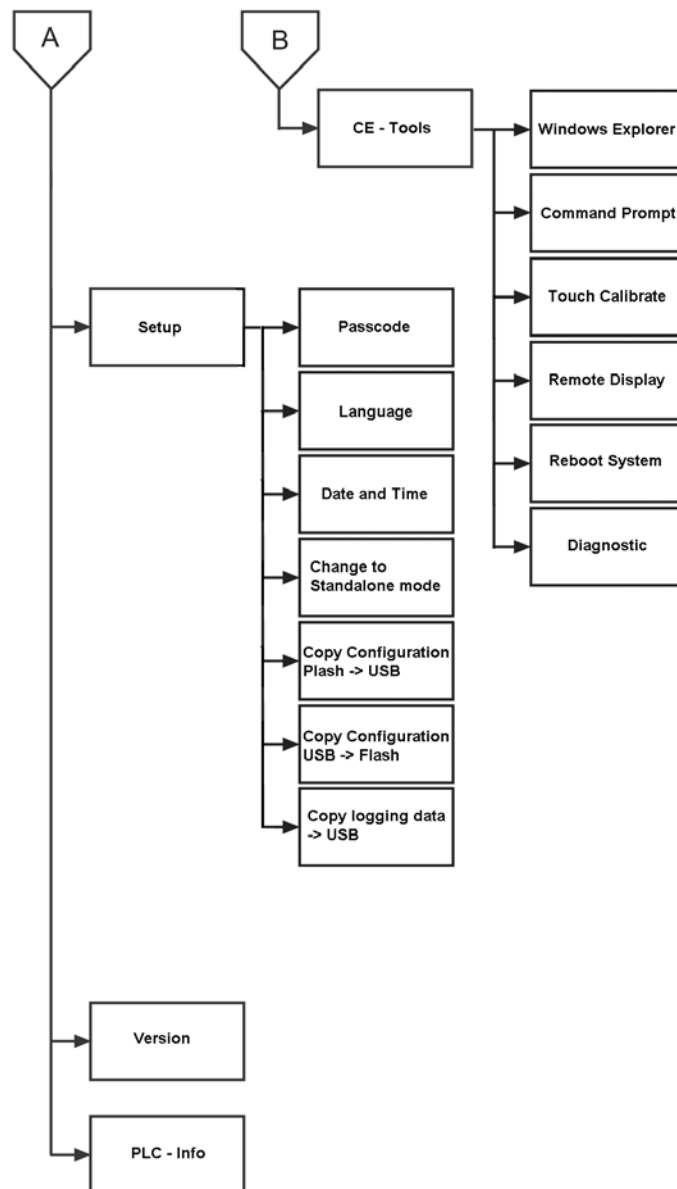
Picture 2-16: Example for an opened menu

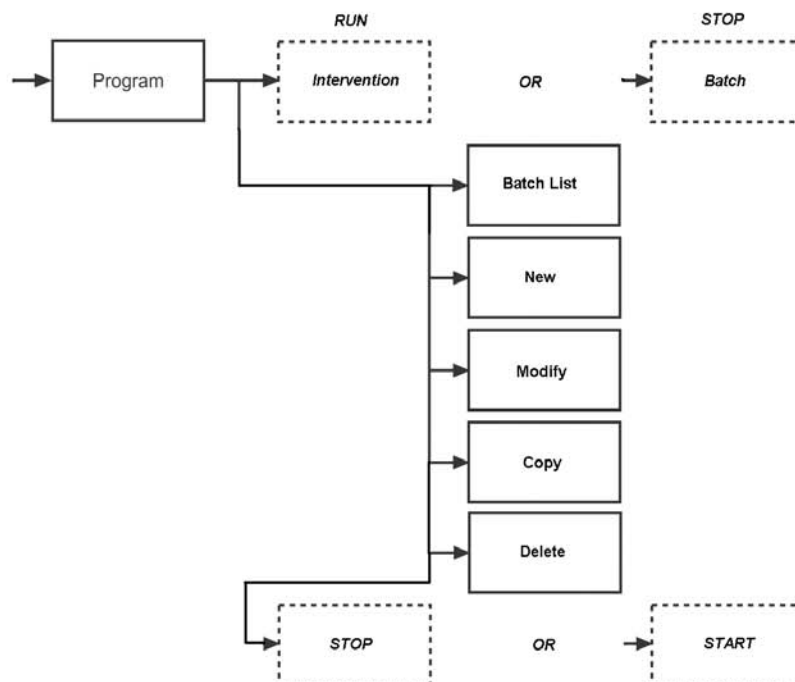
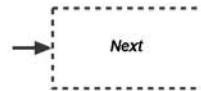
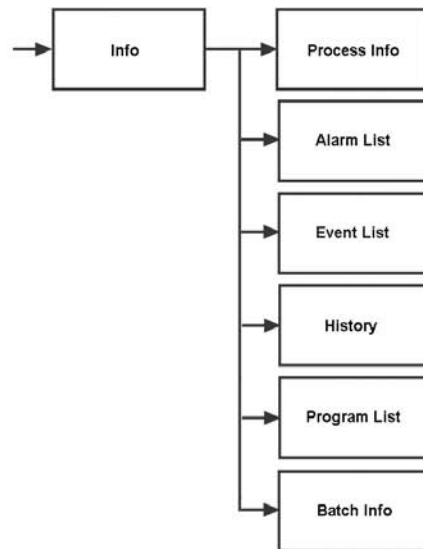
The functionality of the function keys as well as the contents of the menus can be different according to the state of the controller.

The various menu entries can be selected via the cursor keys followed by pressing OK.

On the following page you will find an overview over the menu structure and the menu items.







2.2.2 Message windows

Message windows are displayed on the SECOM providing information and guidance for the user. They point out different events or necessary steps to be taken. Each message window includes a message text as well as an icon. The icon shows the kind of displayed message.

The following information is shown in the message windows:

- **Inquiries**

Inquiries are mostly used for the interactive user guidance, to guide the user step by step through the necessary measures or to point out different possible measures to be taken. Messages, which include an inquiry, are marked with a question mark (general inquiries) or an exclamation mark (safety inquiries).



- **Process messages**

Process messages are generated by the PLC program and include certain information for the user, like e. g. "Color kitchen ready". Process messages are marked with the caution sign. In addition, the number of the process message is shown as well.



- **Alarms**

Alarm messages point out errors or faults within the process or within the system. There are 3 different kinds of alarms.

1. Info alarms
2. Hold alarms
3. Stop alarms

Info and hold alarms, like e.g. "Motor protection addition tank pump" are marked with a warning sign. A stop alarm, like e.g. "PLC communication error" is marked with a stop sign. The alarm number as well as the alarm text is shown.



- **Error messages**

Error messages of the system software point out illegal actions or malfunctions within the system, like e.g. "Program not found". These messages are marked with a caution sign.



2.2.3 Startup screen

After the SECOM is switched on and Windows CE is started the startup screen is shown during the initialization of the SECOM application software.

Depending on the supplier of the controller, the screen may look different.

Picture 2-17:
Example of a start-up screen



After the application software is running the screen changes to the main window automatically.

Editing programs

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3 Basic information

3.1 Program structure

Programs, which are edited and run on a controller, consist of a program header and sequential program steps.

For program administration so-called header information data is required for each program.

This information includes:

- Program number
- Program name
- Comments
- Date of creation
- Date of last change
- Number of steps

Each program step consists of a main function and up to 12 parallel functions.

The main functions control the main process, i.e. related to the main tank of the dyeing machine.

The peripheral equipment of the machine, like preparation tank, addition tanks, color kitchen tanks, pumps etc., are controlled by the parallel functions.

3.1.1 Functions

The SECOM offers a function range that suits all kind of dyeing machines.

Each function has a specific function name, function graphics and several parameters.

All functions of a specific type (like rinsing) are grouped together for an easy reference.

3.1.1.1 Main functions

The main functions control the processes, which are directly related to the dyeing machine.

All machine functions of the same type are grouped together in main function groups.

Each function group includes a function group text and an icon.

Main function groups

The following main functions are included in the standard configuration:

- System



- Filling



- Rinsing



- Draining



- Dosing/inject Add1



- Dosing/inject Add2



- Operator Call



- Dyeing



You will find a detailed description of all the functions in a separate list.

Assignment of main functions

During the project work for your machine, the required main function groups are selected. If necessary, new groups can be added. A maximum of 8 functions can be assigned to each group.

Only the functions that have been selected will be visible during the programming and the production process.

3.1.1.1.1 System functions

Among the main functions, the systems functions have a special purpose.

These functions do not control the machine but are used to trigger certain actions in the SECOM.

The following system functions are implemented in the SECOM:

Program-start

This function **must be programmed** in the first program step.

The program start function initializes the controller in order to start a new batch.

After the program is started, the function is confirmed automatically by the PLC and the program advances to the next step.

Program Start



Program-end

This function **must be programmed** in the last program step.

The program end function stops the program and the mode of the controller changes to "END".

After that it is not possible anymore to start the program of the current batch again.

Program End

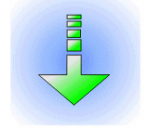


No operation

This function is needed when a step consists of parallel functions only and does not include any main function.

The step confirmation then depends on the programmed parallel functions.

No Operation



Addition start

This function marks an addition start within a program.

Each addition **must be started** with this function.

When an addition is started, this function will automatically be confirmed and the program advances to the next step.

Addition Start



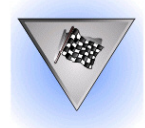
Addition end

This function is programmed at the end of an addition.

Each addition **must be finished** with this function.

When an addition is processed and reaches addition end, the function will automatically be confirmed and the program returns to the "SAMPLE" step it came from.

Addition End



Jump

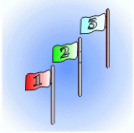


Jump

This function is used to skip parts of the program or to program a loop. A label function is used as a target to jump to. When the program reaches the function "Jump", the process will be continued at the programmed label.

There is no automatic return!

Label



Label

This function marks the target of the program jump. A maximum of 100 jump labels can be defined.

3.1.1.2 Parallel functions

The SECOM provides a parallel function group for each peripheral equipment, like e.g. addition tanks, preparation tank, dye kitchen tank, etc.

Like the main functions all parallel functions of the same type are combined in function groups.

For each group there is a function group text and an icon.

The standard configuration for a jet for instance provides the following parallel function groups:

Parallel function groups

- Pump



- Material flow



- Addition tank 1



- Addition tank 2



You will find a detailed description of these functions in a separate function list.

During the project work for your machine the required parallel function groups are selected. If necessary, new groups can be added. A maximum of 12 parallel function groups can be programmed.

Assignment of parallel functions

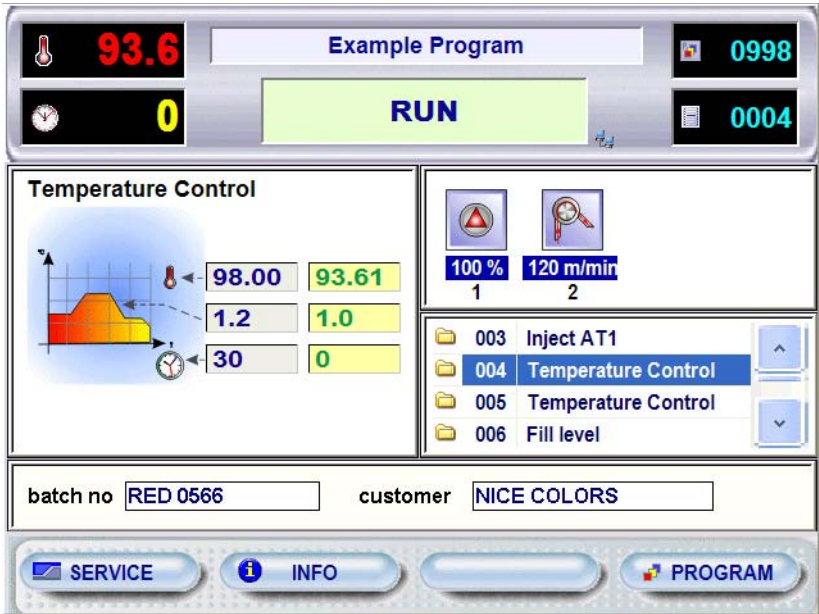
Up to 8 parallel functions can be assigned to each function group.

Only these functions are visible during the programming and the production process.

4 Creating a program

A program can be created while a batch is running or if the controller is in the stop mode.

Picture 4-1: Main menu



To avoid that every operator can invoke the program editor, the SECOM offers the possibility to lock this function with a pass-code.

If the default access is not set at least to level 4 ("Edit"), the operator only gets access to this function by entering the correct pass-code.

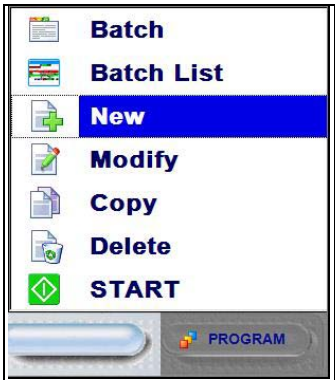
After pressing the lock key, the controller opens a window and you must enter the code. A yellow LED indicates that access to the corresponding level has been granted.



Press key **"PROGRAM" (F4)** in the main window.

A selection menu appears.

Picture 4-2: Program action window



With the cursor keys select line **"New"**.

A window to enter the program header data will be shown.

4.1 Entering the program header

A program header is automatically generated for each new program. Accessible for the operator are the fields for the program number, the program name and the comments.

A number (maximum 4 digits) must be assigned to each program. By default the controller shows the lowest free number (can be changed). This number is the main key for the program administration.

Setting up the program number



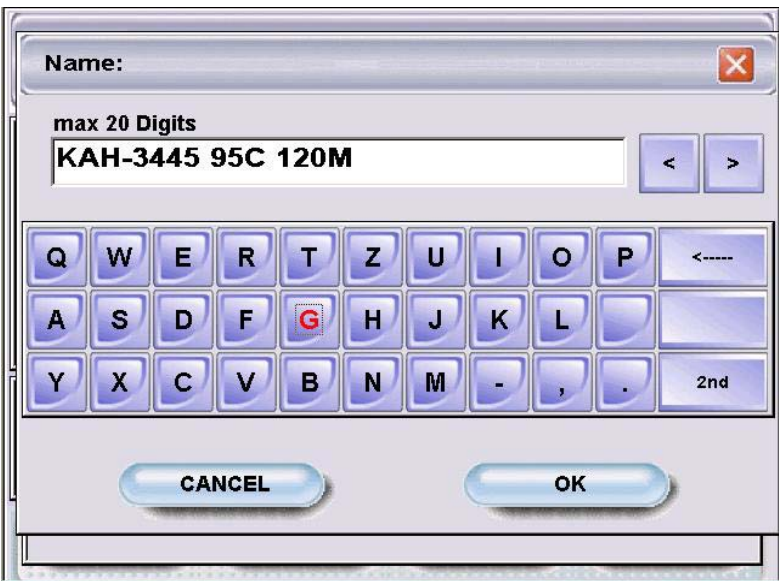
Picture 4-3: Program header window

Confirm the number or enter a new one.

Each program can have a name with a maximum of 20 characters. Thus, the operator has the possibility to enter meaningful program names distinguishing similar programs one from another.

After having entered the program number the window for the input of the program name is displayed. Use the cursor keys and/or the numerical keypad to select the required characters, digits and special of the program name.

Entering the program name



Picture 4-4: Program name input window

Entering program comments

Every program can have a comment of up to 60 characters. This gives you the possibility to save important information with each program, like e.g. "for light color shades only".

After entering the program name press the **OK key** to close the character selection window.

If you do not wish to enter comments press **F2** or use the cursor keys to select "**SAVE**" and press **OK**.

Enter your comments in the first line as explained under program name above.

To enter text in the second line you have to close the selection window by pressing the **OK key** and to move to the second line for comments. Repeat the procedure shown above to enter the second line of text.

Saving the program header

After you entered the program name and eventually the comments please press **F2** or use the cursor keys followed by the **OK key** to store the program header information.

At the same time the window for the input of program steps will be shown.

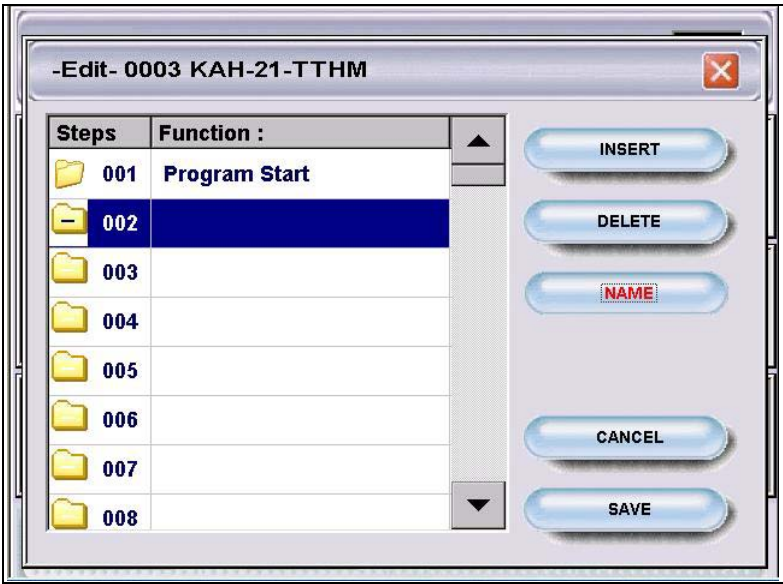
4.2 Entering program steps

The program steps have to be entered in the same sequence they are to be processed later in the program.

Each step has one main function and up to 12 parallel functions (depending on the configuration). Thus, using relatively few steps can create a complete program and it is guaranteed that the parallel processes are running optimized next to the main functions.

4.2.1 Programming main functions

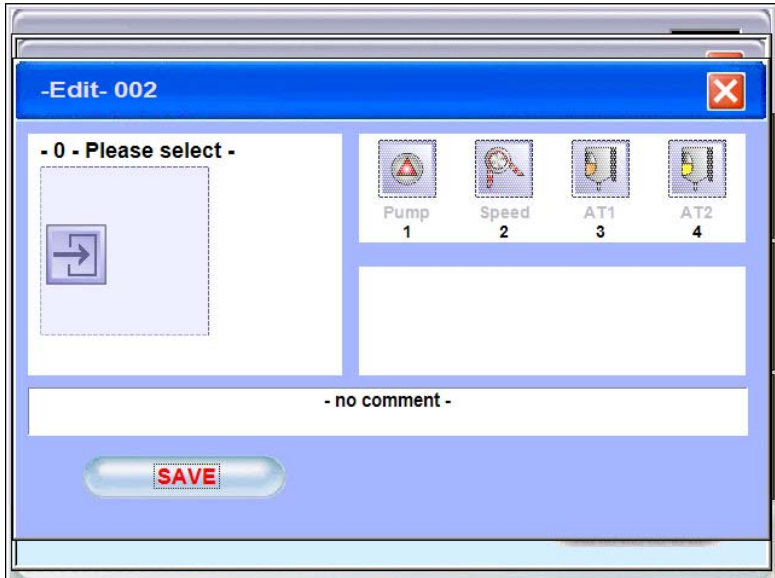
For the programming of the main function you have to select the function group first. Then the desired function is selected.



Picture 4-5:
Program step
Window

Step 2 is marked

"Program start" is inserted automatically as the first program step.
The step marked with the cursor can be programmed after pressing the **OK key**.
A new window for the selection of the function groups is shown.



Picture 4-6:
Selection of function
groups

Selecting main function groups

Press the **0 key** and the group selection window for the main functions will be shown. Each function group has an icon that symbolizes the corresponding group.

Picture 4-7: Example of a main function group window



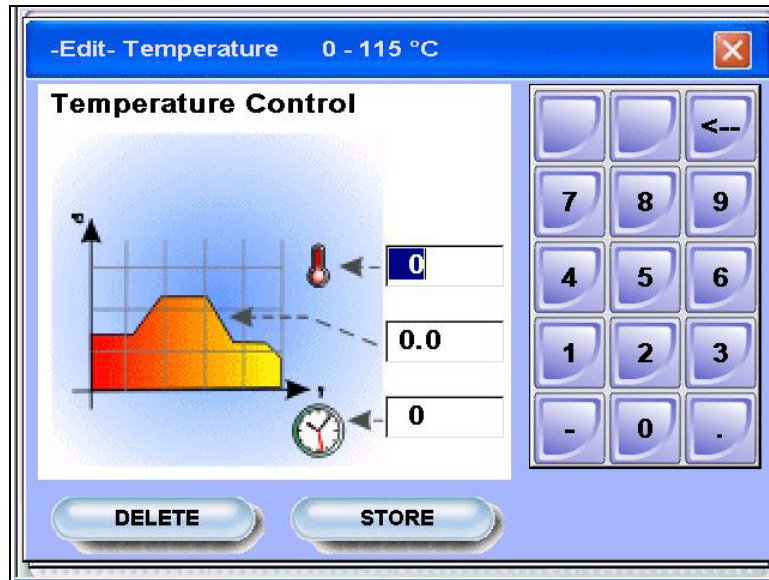
During the project work for your machine, 8 main function groups can be selected as a maximum. They may be different depending on the machine type and your special requests.

- Examples of main function groups:**
- Dyeing
 - Filling
 - Rinsing
 - Draining
 - Dosing ADD 1
 - Inject ADD
 - Operator Call
 - System

Select the requested main function by entering the function group number of the requested main function group or use the **cursor keys** to select it, followed by the **OK key**.

In case that a function group contains only one function, the window to enter the parameters will be displayed directly.

Select the desired function by entering the related number on the keypad (example: temperature control). A window with the function picture and a keypad to enter the parameters will be shown.



Picture 4-8: Example of a function display

Temperature control

For the function "temperature control" you can enter the following values into the three input fields:

Entering function parameters

- Upper field ⇒ temperature
- Middle field ⇒ gradient
- Lower field ⇒ hold time

It might be possible that certain parameter fields contain already some values. If this is the case, then default values have been assigned in the configuration of the controller, representing common settings. The values are automatically inserted if you select a function. This may ease your programming work.

Of course you can overwrite the default value by any other value within specified limits. However, the value entered by you is only valid for the current program step. When you select the same function in another step you will note that the default values are shown again.

During the project work for your machine the minimum and maximum values of each parameter are set in the configuration. When a parameter is entered that is not within the programmed limits, the input is rejected and the configured minimum or maximum values will be used instead. You can overwrite those values again by entering a value that is within the limits.

Min. and Max. values

The name and the minimum/maximum value of the actual edited parameter will be shown in the upper line of the window.

The selection of the parameters takes place by using the cursor keys.



Enter the parameter(s) and press the **F2 key** to save this function.



In case that you do not wish to enter a value at this stage or if you have selected a wrong function, you can delete the function by using the **F1 key**.

Selecting main functions

If a main function group includes more than one function, a selection window with the available functions will be shown first.

Picture 4-9: Function selection window

Main function group
"Operator call"

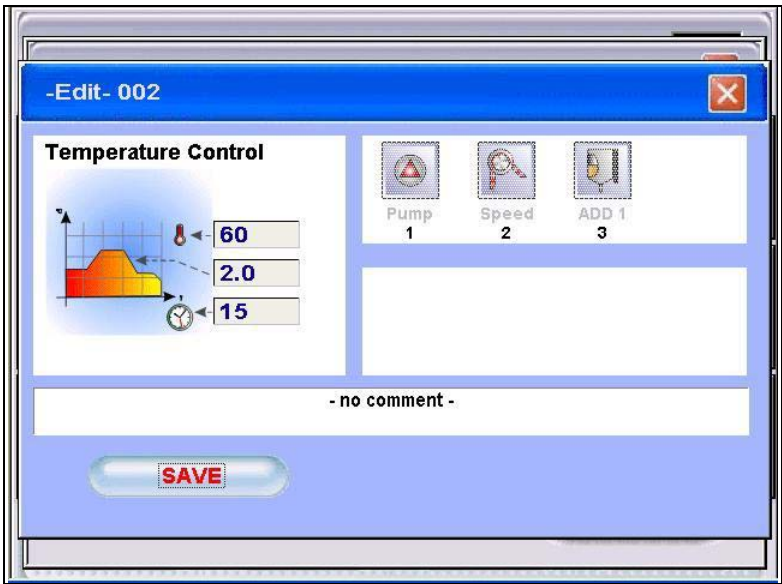


Select the requested function by pressing the related number on the keypad.

4.2.2 Programming parallel functions

Parallel functions are processed parallel to the main functions.

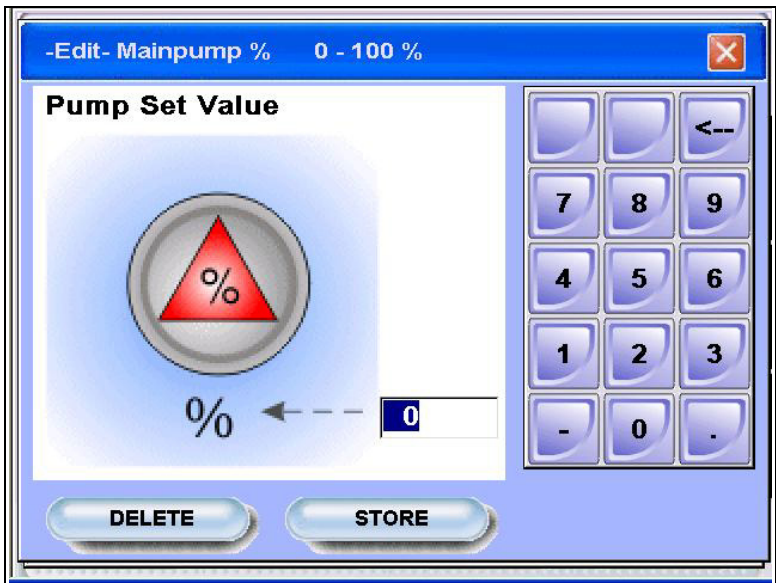
The configuration of the controller contains parallel function groups for the peripheral equipment of the machine, like e.g. preparation tank, addition tank, dye kitchen tank, pump, winch, etc.



Picture 4-10: Select parallel function group

Enter the number of the parallel function (group) you want to select.

In case that a function group contains only one function, the window to enter the parameters will be displayed directly.



Picture 4-11: Enter parallel function parameter

Enter the parameter(s) and press the **F2** key to save this parallel function.



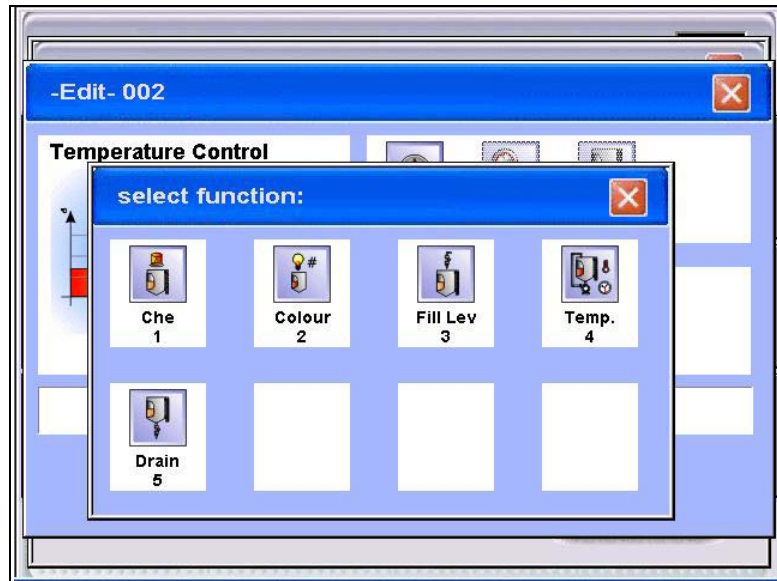
In case that you do not wish to enter a parallel function at this stage or if you have selected a wrong function, you can deselect/delete the parallel function by using the **F1** key.



Selection of parallel functions

If a parallel function group includes more than one function, a selection window with the available functions will be shown first.

Picture 4-12:
Example of a
function selection
window



The requested function can be selected by pressing the related **number key** or by using the **cursor keys**, followed by the **OK key**.

Programming parallel functions only

If you want to program a step with a parallel function only, you must program the function "No Operation" as a main function first. This function can be found in the main function group "System".

After this is done, you can select and program the parallel function(s) as described above.

Copied parallel functions

Some parallel functions like pump and material flow (that are needed in nearly all steps) are marked as "copied functions" for easier programming.

If these functions are programmed in one step, they will automatically be copied to all following steps. Thus, it is not necessary to program them over and over again.

In case you need other parameter values for these functions from a certain program step onwards, you can change of course the parameters at any time.

4.2.2.1 More than 8 parallel function groups

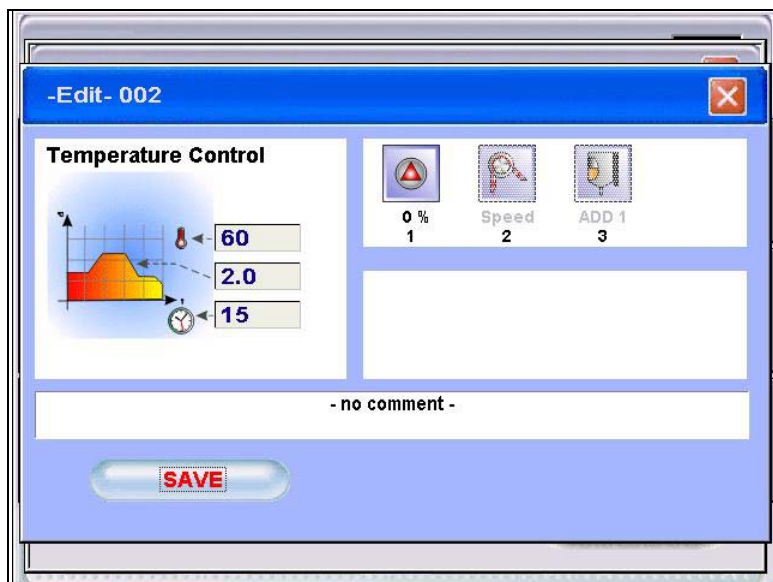


If more than 8 parallel function groups are available in the configuration for your machine, an arrowhead is shown at the right hand side of the window.

4.3 Saving program steps

After the selection and programming of main and parallel functions, the current program step can be saved.

Select with the cursor keys the **“SAVE” button** and use the **OK key** to confirm and store the step.



Picture 4-13:
Programmed step

The step is saved in the SECOM intermediate memory and the program step window is shown again. The main function text of the step that has just been saved will be displayed and the next program step will be marked.

All following steps are programmed as described above.

4.4 Saving programs

You can leave the program editor by pressing the **Esc key**.

The current edited program will **automatically** be stored in the SECOM.



5 Modifying programs

All existing programs can be modified either if the controller is stopped or while a batch is running.

To avoid that every operator can invoke the program editor, the SECOM offers the possibility to lock this function with a pass-code.

If the standard access is not set at least to level 4 ("Edit"), the operator only gets access to this function by entering the correct pass-code.

After pressing the lock key, the controller opens a window and you must enter the code. A yellow LED indicates that access to the corresponding level has been granted.



Press key **"PROGRAM" (F4)** when in the main menu.

Picture 5-1: Program action window

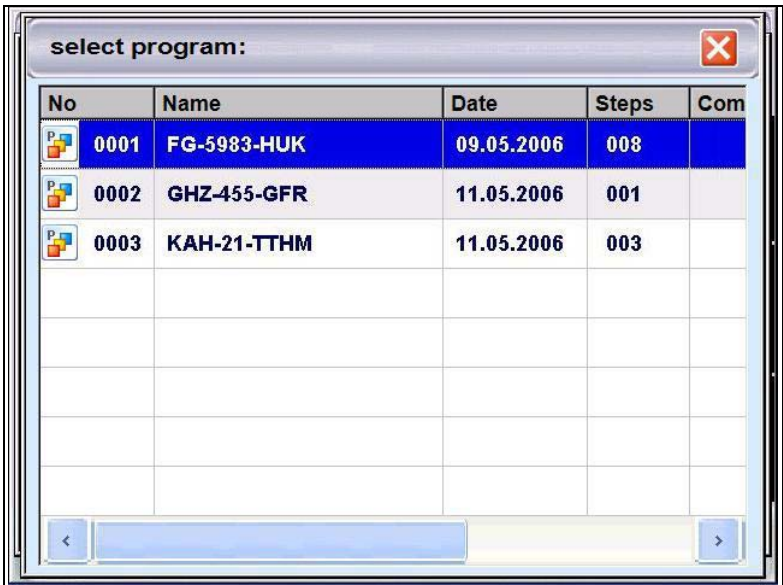


A selection menu is shown.

Select menu item **"Modify"** by using the cursor keys and confirm with the **OK key**.

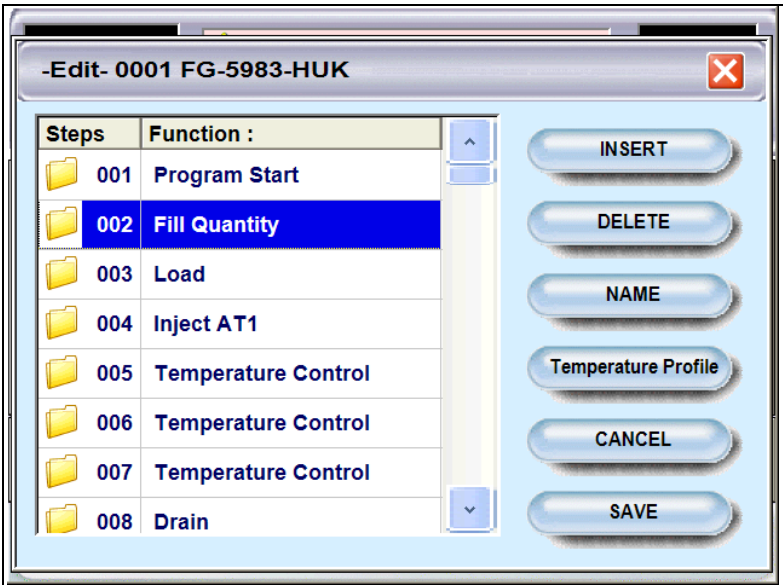
A window showing all programs stored in the SECOM will be displayed.

5.1 Selecting a program



Picture 5-2: Program selection window

Select the program to be modified by using the cursor keys followed by the **OK key**.
The program step window of the selected program will be shown.



Picture 5-3: Program window

On the left side of the window the various program steps will be shown (main functions), on the right side you can find 6 fields.

You have to use the cursor keys “**left / right**” to switch between the step list and the fields. The active field will be shown with red letters and a frame.

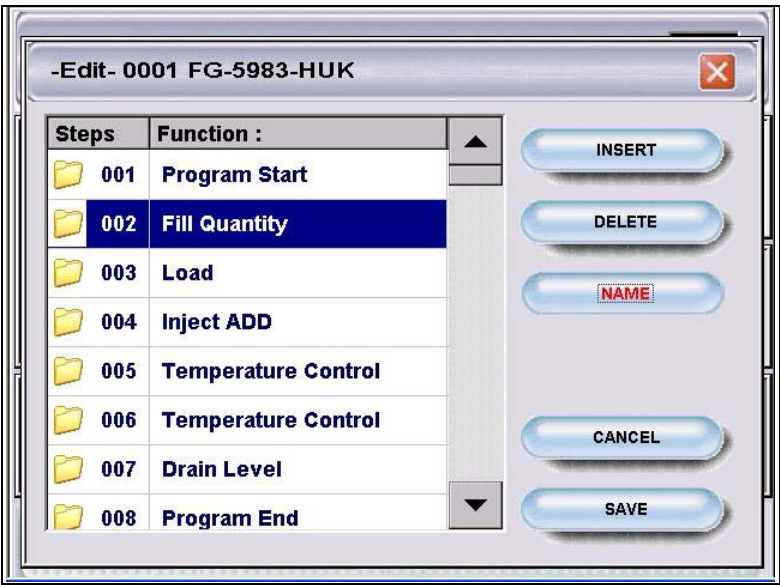


With the “**up / down**” cursor keys the different fields can be selected. Pressing the **OK key** start the selected function.



5.2 Changing program names and comments

Picture 5-4: Program window



Press the **F3 key** or select the "NAME" field by using the cursor keys and press **OK**.

Program name and comments of the program are displayed.

Picture 5-5: Program name and comment window



Select the field to be modified by using the cursor keys..

The character selection window appears.

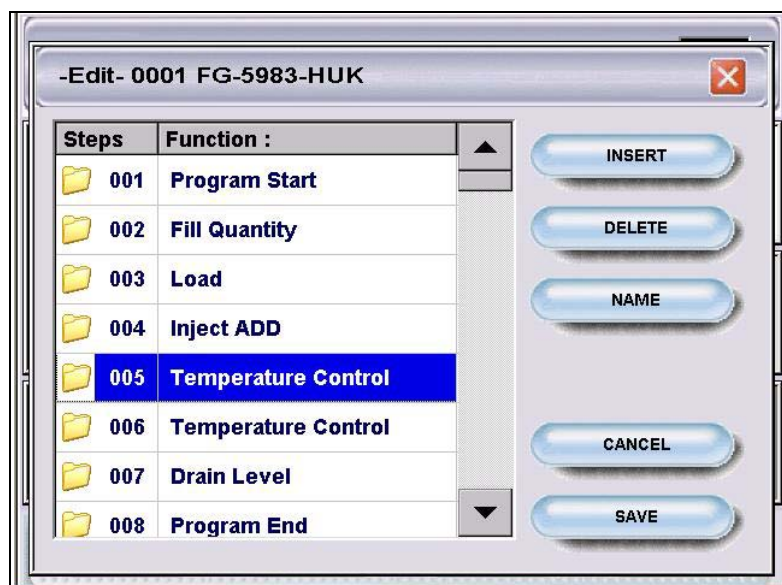
Enter, change or delete the characters as described above for creating a program.



If you are done, press the **F2 key** or select the "SAVE" field with the cursor keys and confirm with **OK**. This stores your modification and the window will be closed.

If you changed the program number then you have created a copy of the program under a new program number.

5.3 Modifying a program step

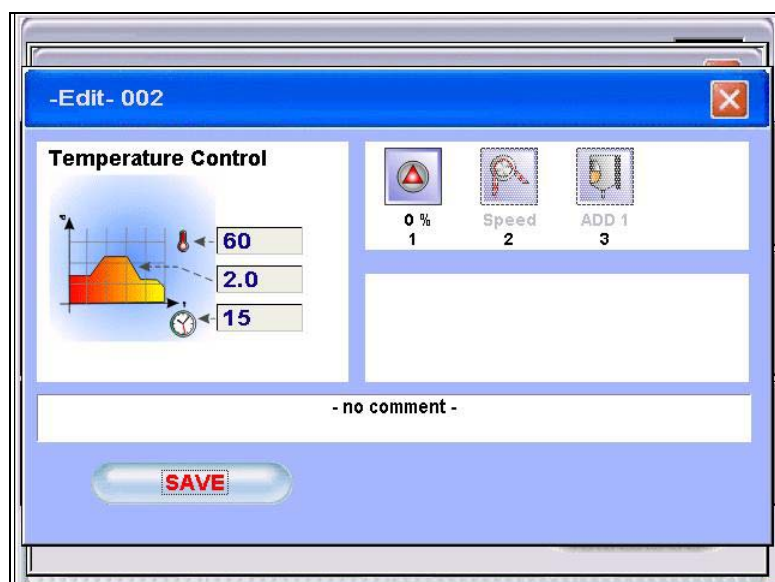


Picture 5-6: Program step window

Select the program step to be modified by using the cursor keys.

You now have the possibility to modify or to delete an existing step or to insert a new step at this point of the program.

Press the **OK** key to confirm the program step selection. The step function window is displayed.



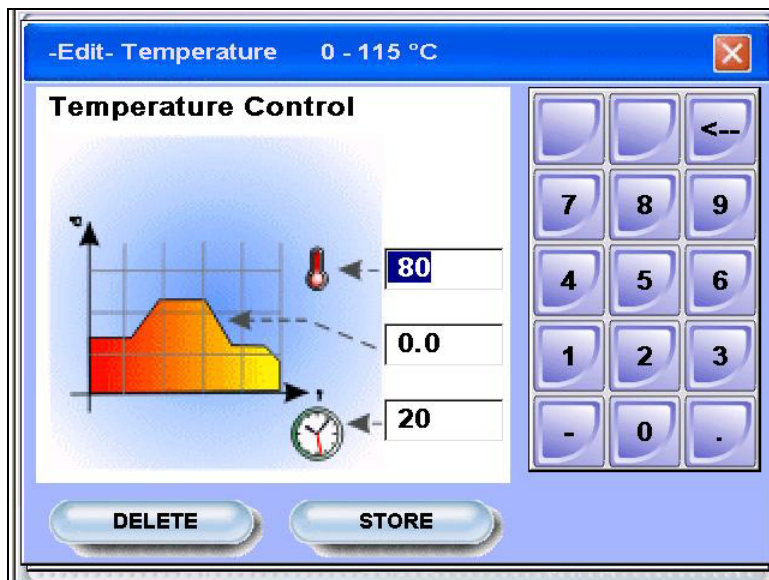
Picture 5-7: Programmed step

5.3.1 Modifying the main function parameters

Press the **0** key. The function window will be opened.

You can modify the values if the field is displayed in inverted colors (white text on blue background).

Picture 5-8: Function step window



If you are finished with your modification press the **F2** key to save the changes.

5.3.2 Exchange/delete main functions

In order to delete or exchange a main function please press the **0** key. The window to enter the function parameters will be shown.



Press the **F1** key. The function will be deleted and you get back to the step window. If necessary you can now program a new main function (function exchange).

5.3.3 Edit parallel functions

You can edit the parameters of programmed parallel functions or you can delete functions or insert new ones.

5.3.3.1 Change parameters of parallel functions

Enter the number shown underneath the desired function. A window to enter the function parameters will be shown.

Now select the parameter which value you want to change (the selected parameter is shown with a blue background) and enter the new value via the numeric keypad.

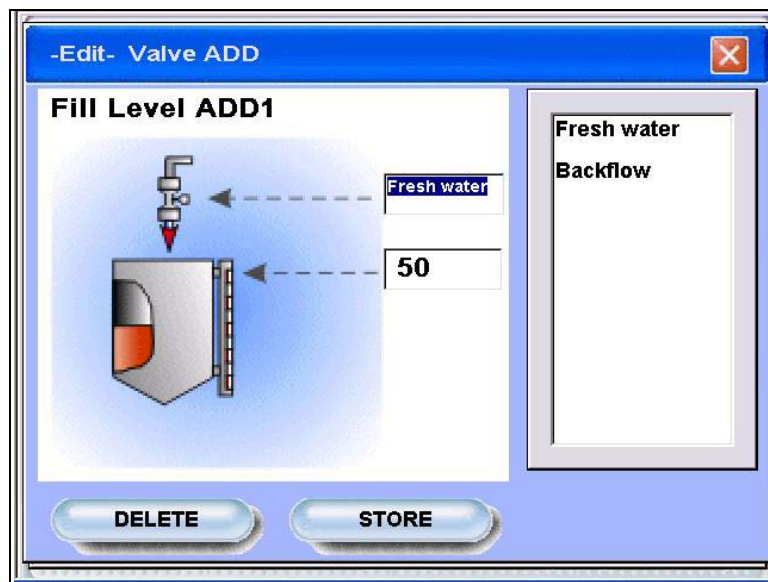
In order to save the changes please press the **F2 key**.



5.3.3.2 Delete parallel functions

First, enter the number shown underneath the desired function. A window to enter the function parameters will be shown.

Please press the **F1 key**. The function will be deleted and you get back to the step window. If necessary you can now select a new function (function exchange).



Picture 5-9: Function window

5.3.3.3 Program new parallel functions

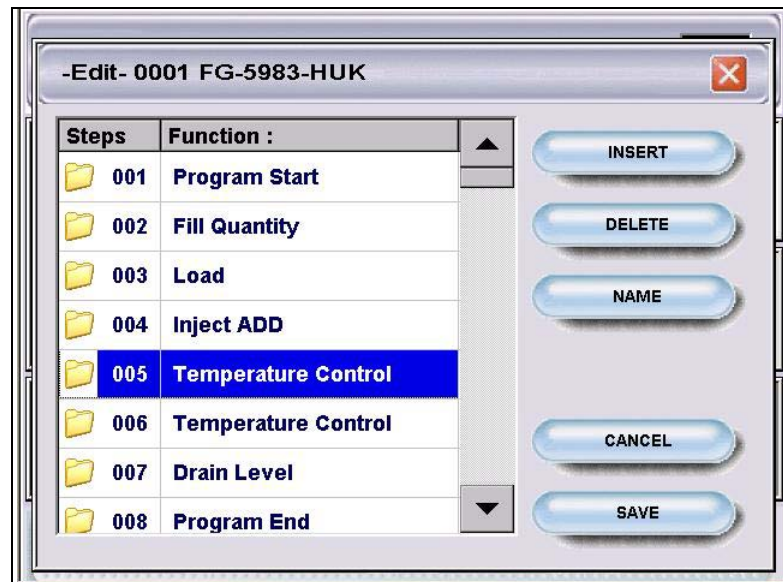
If no function is programmed on the selected resource (is the case if the parallel function icon is grayed out) then you can program a new parallel function. This is done in the same way as already described in chapter "Programming parallel functions".

5.4 Inserting a program step

Mark the step in the program step window by using the cursor keys to insert a step above the selected one.

Picture 5-10:
Program step
window

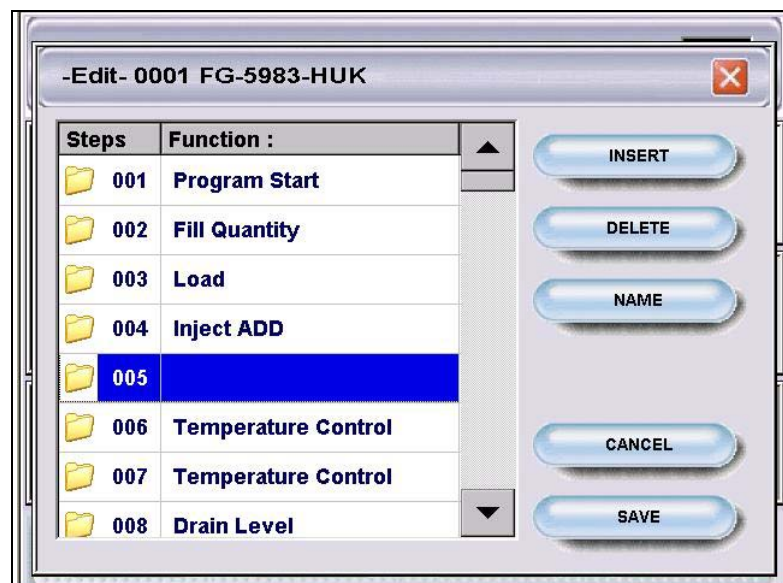
Step 5 has been
marked



Press the **F1** key or select the "INSERT" field by using the cursor keys followed by the **OK** key.

Picture 5-11:
Program step
window

An empty step has
been inserted on step
5



An empty step is inserted at the marked position and all following steps are moved one step down.

Press the **OK** key in order to select the function and to program and save the step as described earlier.



You have to use the cursor keys "left / right" to switch between the step list and the fields. The active field will be shown with red letters and a frame.



With the "up / down" cursor keys the different fields can be selected. Pressing the **OK** key executes the selected function.

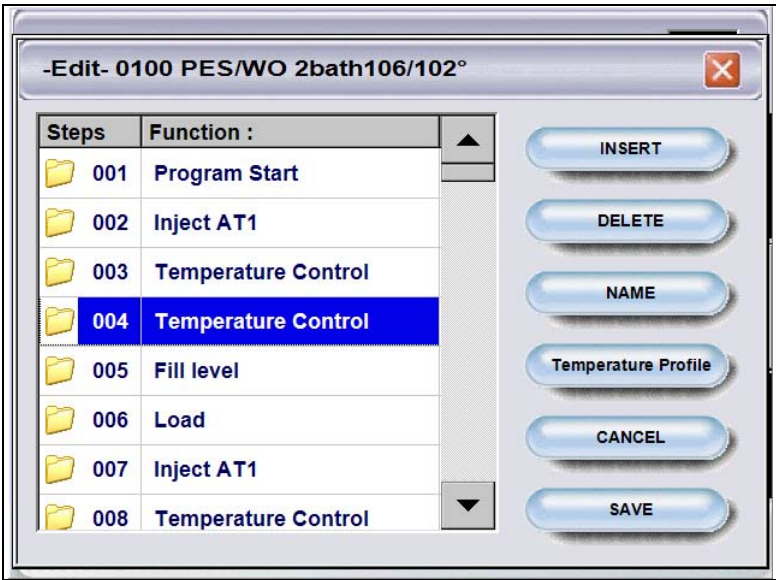
5.5 Deleting a program step

Mark the program step to be deleted in the program step window by using the cursor keys. Then press the **F2** key or select the “**DELETE**” field with the cursor keys and confirm with the **OK** key.

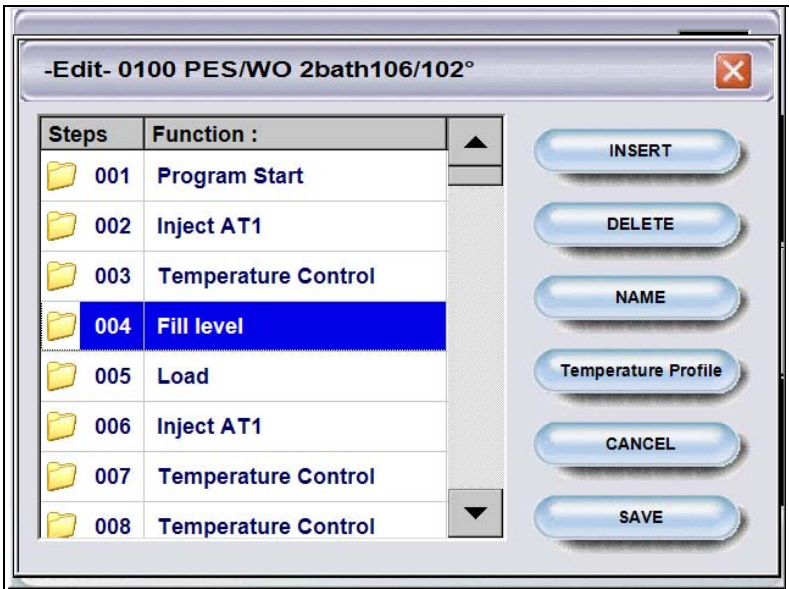


Picture 5-12:
Program step
window

Step 4 marked for
deletion



The marked step will be deleted and all following steps are moved up one step.



Picture 5-13:
Program step
window

Step 4 has been
deleted

6 Copying a program

When creating a program that is quite similar to an already existing program, you can use the copying function to simplify the programming work. After having copied the program, you can modify the steps and functions that are different.

Moreover, it is possible to copy programs from or to a USB memory stick and to transfer the copied programs to other controllers. If the controller is connected to a host system, it is also possible to copy programs from or to the host. Thus, a program created on one controller can run on other controllers as well (if the machines and the functions are similar!) without the need to write it over and over again.

It is possible to copy programs from the main menu while a batch is running or if the controller is stopped.

To avoid that every operator can invoke the program editor, the SECOM offers the possibility to lock this function with a pass-code.

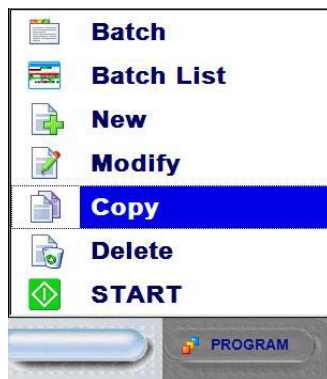
If the standard access is not set at least to level 4 ("Edit"), the operator only gets access to this function by entering the correct pass-code.

After pressing the lock key, the controller opens a window and you must enter the code. A yellow LED indicates that access to the corresponding level has been granted.



Press key "**PROGRAM**" (**F4**) when in the main menu.

Picture 6-1: Program action window



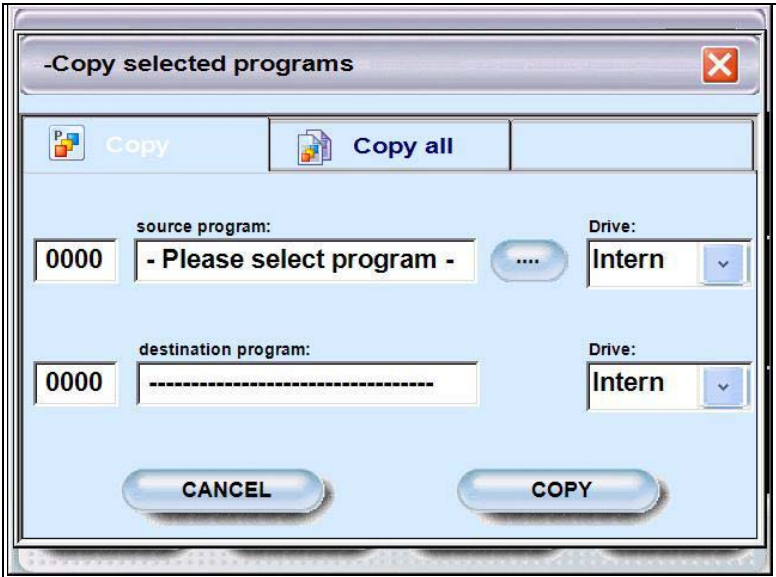
A selection window is shown.

Select menu item "**Copy**" by using the cursor keys followed by the **OK** key.

A window for the copy will be opened.

6.1 Copying a program on the controller

Make sure that all drives for the source and the target program are set to "Intern".



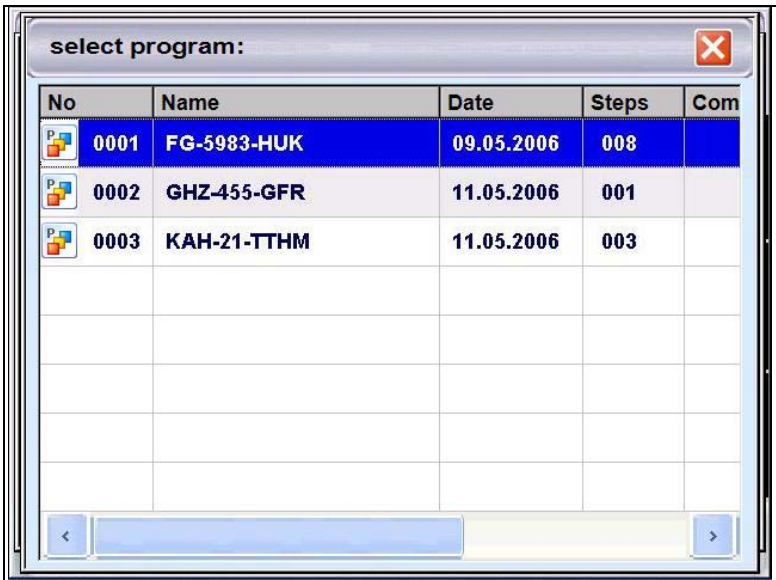
Picture 6-2: Program copying window

In order to do this, activate the field "Drive", press the **OK key** and select "Intern".



Picture 6-3: Select drive

With the help of the cursor keys and the **OK key** you can activate the different input and key fields. Activate the field for the "Source program" to select the program that will be copied. A list of all available programs in the SECOM will be displayed:



Picture 6-4: Program selection window

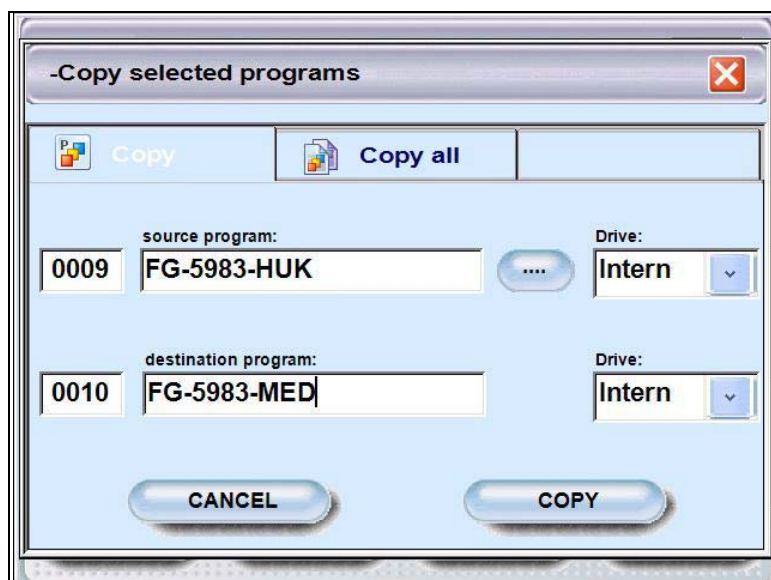
Select the program to be copied by using the cursor keys and **OK**.

The selected program is shown in the program source field as well as in the destination field.

The controller will automatically assign a **new** program number (next lowest, unused number) for the target program. By selecting the destination field you can modify the program name and you can also choose a different number if you want to.

Picture 6-5: Program copy window

the target program has been specified



Select the **"COPY"** field by using the cursor keys followed by the **OK key**.

The program is copied (with the new name) to the new program number on the internal flash disk.

Every time you copy a program, a message will be shown. The displayed text either indicates that the copy process has been successful or that an error occurred.

Picture 6-6: Program copy window

Copying was successful



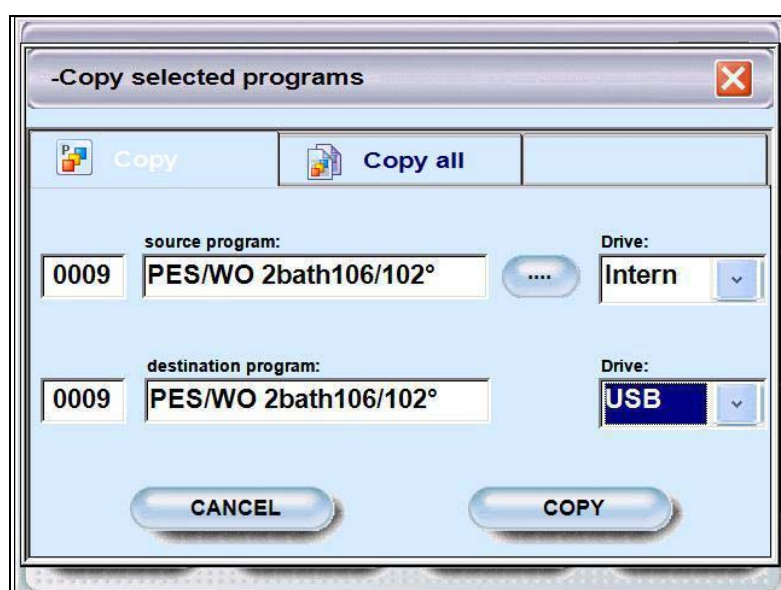
6.2 Copy to an external drive

In order to create backups of programs or to exchange dye programs between controllers that have the same function configuration, programs can be written and read to/from external media.

6.2.1 Copy via USB (USB memory sticks)

Dye programs from controllers can be stored on USB memory sticks and can be read back from there. For this the memory stick needs to be connected to the USB port of the controller.

For the copy process the source or destination drive must be set to **USB** instead of **intern**.



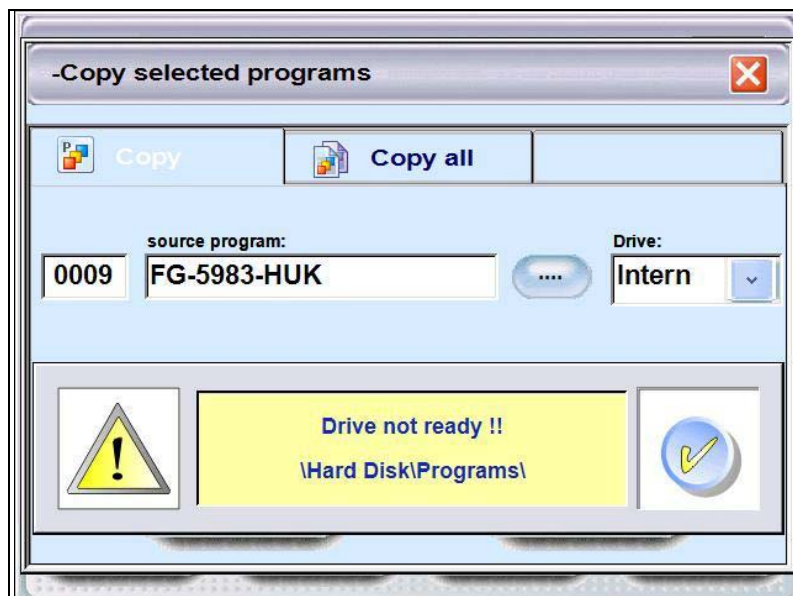
Picture 6-7:
Program copy-
window

“USB“ has been
selected

Please note that it will take some time until the external USB memory stick is recognized and the controller can start the copy process.

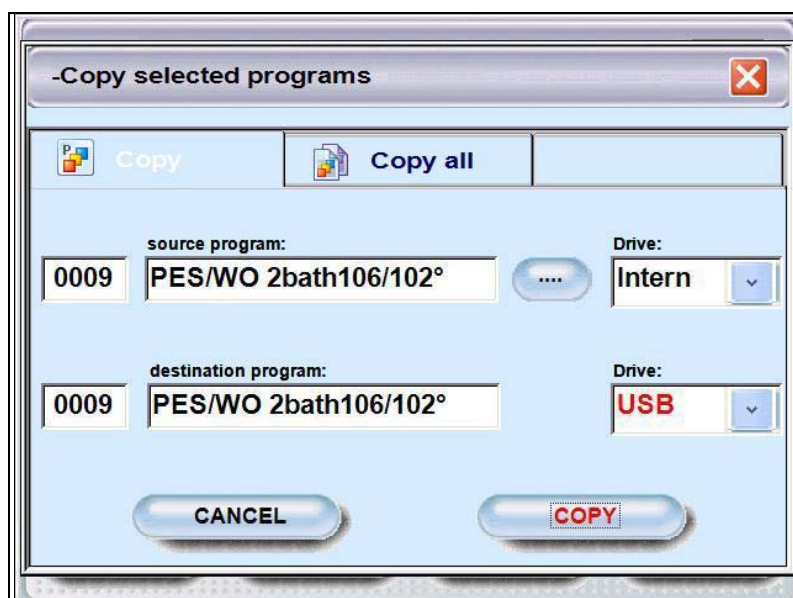
If the “**COPY**” field is selected too early, the following message will be shown.

Picture 6-8: Drive not ready



Press the **OK** key and check the color of the USB selection. As long as it is shown in red color, the stick is not recognized and it will change to black if it is. Then you can try to start the copy process again.

Picture 6-9: Select drives, drive not recognized!



Other reason for drive not ready could be that the USB stick is not formatted, defective or not (correctly) inserted.

6.2.2 Copy via the network (host operation)

Under network operation the controller can store and read dye programs from/to a network drive. All controllers of a certain machine group (machines with the same function configuration) will access the same network directory which allows exchanging programs directly via the network.

For the copy process the source or destination drive must be set to **Host** instead of **intern**.

6.3 Copying all programs (backup)

This function allows copying all available programs without the need to selecting them. This functionality is mainly used to create a backup of the dye programs on a memory stick or to exchange complete sets of programs between controllers.

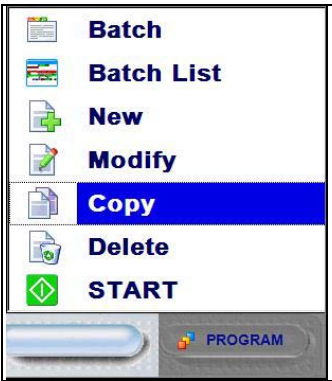
Press key **“Program” (F4)** in the main menu.



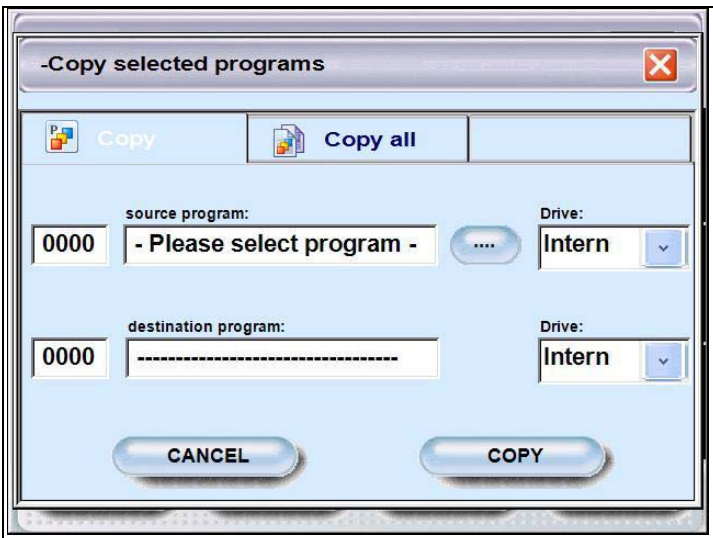
Picture 6-10:
Program action
window

A selection window will be shown.

Select menu item **“Copy”** by using the cursor keys and the **OK key**.



A window for the copy operation will be shown.



Picture 6-11:
Program copy
window

Please use the cursor **“right”** key.

The next window will be opened where you can select the source and destination drive. As an example we will copy all internally stored programs to the USB stick.

Picture 6-12: Select drives



To start the copy process, press the **F2** key or select the “**COPY**” field with the help of the cursor keys and the **OK** key.

6.4 Copy messages



The following errors may occur:

There is not enough space on the flash disk to save another program.

The USB stick has been selected as drive but has not been inserted. You will find more information on the USB stick in chapter 1, item 2 Operation, on page 1-3.

A host as drive has been selected but there is no connection to a filesaver.

Picture 6-13: Error message "No USB stick"



7 Deleting a program

You can delete a program from the main menu either if the controller is stopped or while a batch is running.

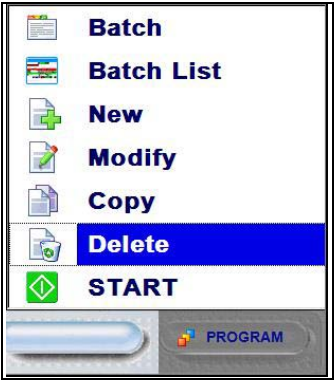
To avoid that every operator can invoke the program editor, the SECOM offers the possibility to lock this function with a pass-code.

If the standard access is not set at least to level 4 ("Edit"), the operator only gets access to this function by entering the correct pass-code.

After pressing the lock key, the controller opens a window and you must enter the code. A yellow LED indicates that access to the corresponding level has been granted.

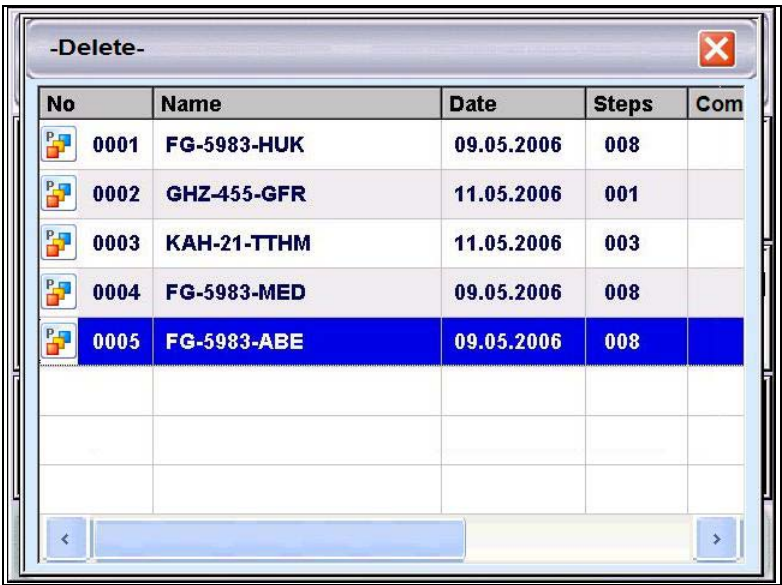
Press key **"PROGRAM" (F4)** in the main menu. A selection window will be shown.

Select menu item **"Delete"** by using the cursor keys and press **OK**.



Picture 7-1: Program action window

A list of all programs in the SECOM is displayed.

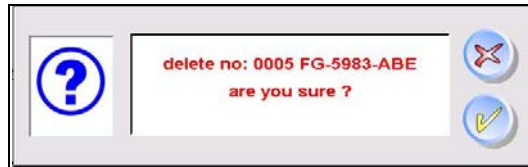


Picture 7-2: Program selection window

Select the program you want to delete by using the cursor keys followed by **OK**.

Before the program is actually deleted, a confirmation window will be shown.

Picture 7-3:
Confirmation
window



Press the **ESC** key to cancel the deleting process.



Press the **OK** key to delete the selected program.

8 Addition treatment

The daily work in a dye house often requires using addition treatments while a batch is running.

When writing new dyeing programs, addition treatments that might become necessary during the dye process, can already be implemented.

When a program is running and the function **"Operator call Sample"** is active, it is possible to select addition treatments. Only the additions that have been set up with the program are displayed. Additionally, reasons for addition treatments can be selected and assigned.

From "Sample" to "Addition" and back

When the addition is finished, the SECOM automatically jumps back to the function "Operator call sample" where it came from.

The advantages of this kind of additional treatment are obvious:

Advantages

- All different additional treatments are processed in the same way
- The number of additions and the run time thereof can clearly be registered
- Reasons for additions can be registered and analyzed

8.1 Marking the additions

In order for the SECOM to recognize additions the system function **"Addition Start"** has to be programmed as the first step and the function **"Addition End"** has to be programmed as the last step of the addition treatment.

Defining additions

You may enter an addition name for each system function "addition start" to clearly specify all different additions.

It is possible to edit up to 100 different addition texts, like e. g:

Addition texts

- SUBST. 98°C 15 MIN
- DISP. 130°C 20 MIN
- REACTIVE 50°C 30 MIN
- ADDING SALT 15 MIN
- ADDING ACID 10 MIN

8.2 Program structure of addition treatments

Basic rules to be observed:

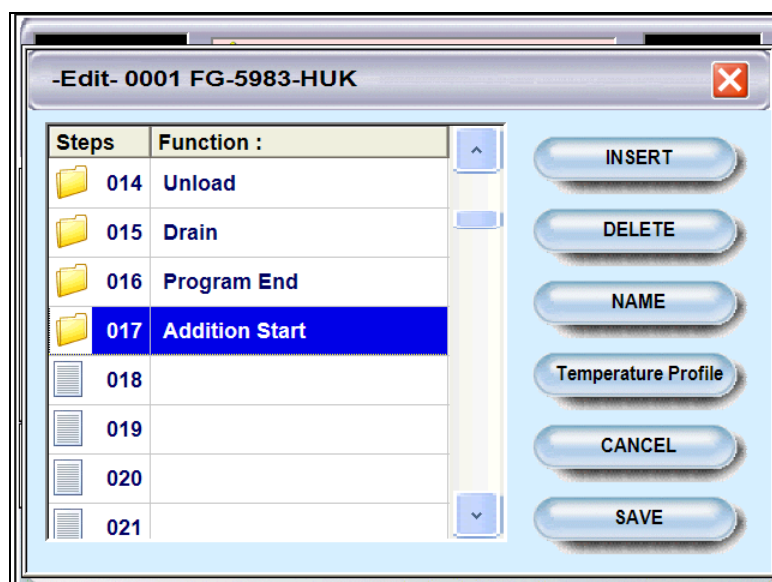
- All addition treatment steps have to be programmed after the system function "Program End".
- Every addition treatment has to start with the system function "Addition Start" and has to end with system function "Addition End".
- Several additions can be programmed one after another.

8.3 Creating an addition treatment

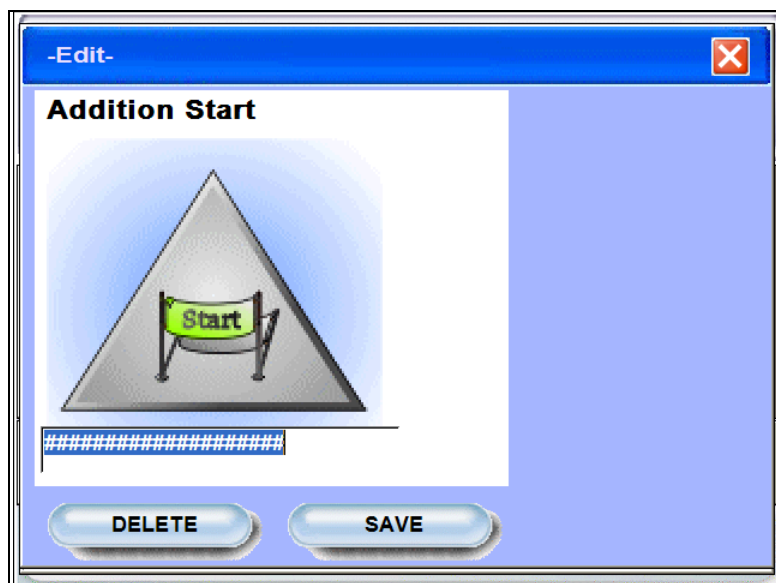
You can create an addition treatment while writing a program or by modifying an existing program.

Picture 8-1: Program step window

Edit addition treatment



After the function "**Program End**" in the program step window, the system function "**Addition Start**" has to be programmed.



Picture 8-2:
"Addition Start"
window

If the **"Addition Start"** function is selected, press **OK** to open the list with the addition texts.

A list with all existing addition texts is shown.



Picture 8-3: Addition
text window

Select the matching addition name by using the cursor keys.

Press the **OK key**.

You will find a description on how to modify addition texts and how to set up new addition texts under 8.4 Defining addition texts, on page 2-56.

The step can now be completed with eventually necessary parallel function and then be saved.

After that, the next steps of the addition treatment can be programmed as well.

The system function **"Addition End"** has to be programmed **as the last** step of the addition treatment.

If more addition treatments are required, they have to be programmed **directly** after the system function "Addition End".



Possible errors:

In case you forgot to program "Addition End", the controller advances to the next program step (if available) instead of jumping back to the "Sample" step!

If there is no more step available, the controller changes the status to "END", the batch is finished and **cannot be started again!**

8.4 Defining addition texts

In case that further addition texts are needed or if it is necessary to modify an existing text, you have to open the program editor.

You get to the addition text window if you edit an existing step where the system function "Addition start" is programmed. If the "**Addition Start**" function is selected, press **OK** to open the list with the addition texts. A window with a list of all existing addition texts will be opened.



Select the text to be modified by using the cursor keys. Then press the **F1 key** or select the "**Modify**" field by using the cursor keys followed by **OK**.

The addition texts are edited with the help of the keyboard window. Enter the required characters as described earlier in item 4.1 Entering the program header, on page 2-27

Picture 8-4: Addition text window

Addition text has been edited



Select with the cursor keys the "**OK**" field and press the **OK key** to save the modified text.

9 Variable function parameter

When making up the machine configuration, formulas can be created that use certain batch data in order to calculate specific function parameter values. These parameters then become variable ones. During programming a function for which a formula exists, the operator has the choice to either enter a fixed value or to choose the result from the formula as function parameter (e.g. filling quantity).

With these variable function parameters it is possible to adapt and to optimize standard programs for different batch weights, different materials and shades.

When starting a batch, the required parameters, like batch weight and liquor ratio are entered. When the controller comes to a function that uses the related formula (filling with counter for instance), the batch parameters are processed and the filling value as a result (in this case) is automatically calculated and used as parameter value rather than a fixed value.

9.1 Definition of variable function parameters / formulas

Variable function parameters have formulas assigned in the machine configuration.

These formulas may include the following components:

- Batch parameters
- Set values (function parameters)
- Actual values
- Timer values
- Machine constants
- Numerical constants

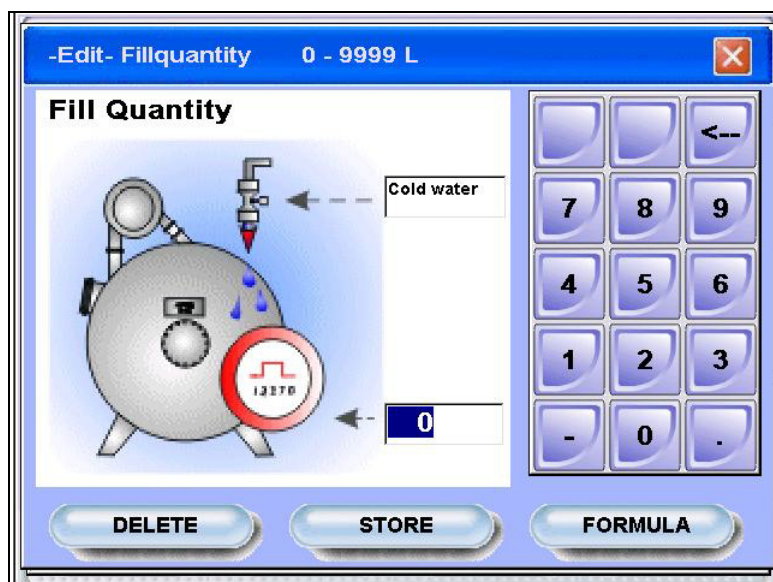
All values can be combined with each other. Due to this, numerous variations of formulas are possible, from a very simple assignment up to a complex calculation.

You will find a description of the programmed formulas in your machine configuration in your supplier's documentation.

9.2 Editing variable function parameters

When editing a function and an input field for a variable function parameter is reached, the field **"FORMULA"** is displayed in the program function key line.

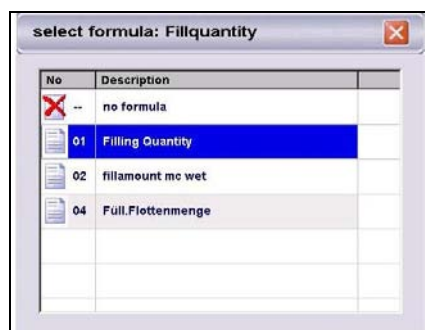
Picture 9-1: Edit variable function parameters



Press the **F3 key** or select the **"FORMULA"** field with the cursor keys and the **OK key** to choose the input for this parameter.

The formula(s) available for this parameter are displayed.

Picture 9-2: Formula list



Select the required formula by using the cursor and the **OK key**.

Press the **F2 key** or select the **"STORE"** field to save the step.

The following entry will be shown in the parameter field after having selected a formula:

F{0}



Picture 9-3:
A formula has been
selected

If a set value is included in the formula, then in addition to select a formula you have to enter the set value into the parameter field.



Picture 9-4:
A set value has been
entered

The following entry will be shown in the parameter field when a formula has been selected and a set value has been entered:

F{xxx}

xxx = set value entered

If this concludes programming this step, press the **OK** key.

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10 Starting a batch

10.1 General Information

To collect batch data it is necessary to start batches. First of all, a batch has to be created and a program has to be assigned to every batch. Depending on your machine configuration it is possible to enter additional information for every batch like batch texts and batch parameters. After all entries have been made using the “Start” key can start a batch.



The dialog box titled "-Batch-" contains the following fields and table:

No: 0100 **Program Name:** FG-5983-HUK **Referenz No.:** 000009

No	Batch Parameter	Value	Unit
03	article	Kantakka	Text
04	colour number	12345	Text
05	shade	light blue	Text
06	load	50.00	Kg
07	length	1900.0	m
08	liquor ratio	8.0	L/Kg

Buttons: CANCEL, OK

Picture 10-1:
Example: Creating a
batch with batch
texts and parameters

Batch texts are entered as alphanumeric values and are stored as batch info. They will help to assign a certain batch to a customer or order. You will find more information on batch texts in item 10.4.1 Entering batch texts, on page 3-67 in this chapter.

Batch parameters are entered as numeric values, which are used for the calculation of variable function parameters. Using these parameters make the programs more universal and the filling quantity can be calculated in accordance with the batch weight and the liquor ratio. You will find more information on the batch parameters in item 10.4.2 Entering batch parameters, on page 3-68 in this chapter.

The SECOM provides a maximum of 20 input fields for the input of batch texts, like customer name, order number etc. and a maximum of 20 input fields for the input of batch parameters like batch weight, fabric length or liquor ratio etc. Please note that the number of texts and parameters (if any) depends on the particular configuration and may vary from configuration to configuration.

In case that your machine configuration includes formulas (see chapter 2 / 9 Variable function parameter), these parameters are assigned when starting the batch. Depending on the configuration the calculation of the formulas takes place either at batch creation time or when the particular function is activated.

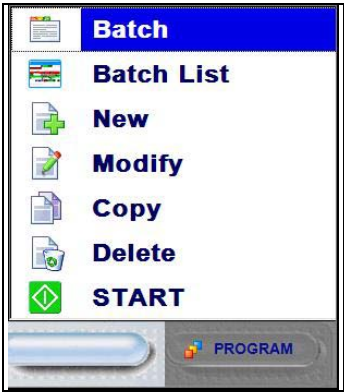
10.2 Opening the batch creation window



If the controller is in the **stop mode** press the **F4** function key. A menu is shown. Please use the cursor and the **OK key** to select the “**Batch**” menu item.

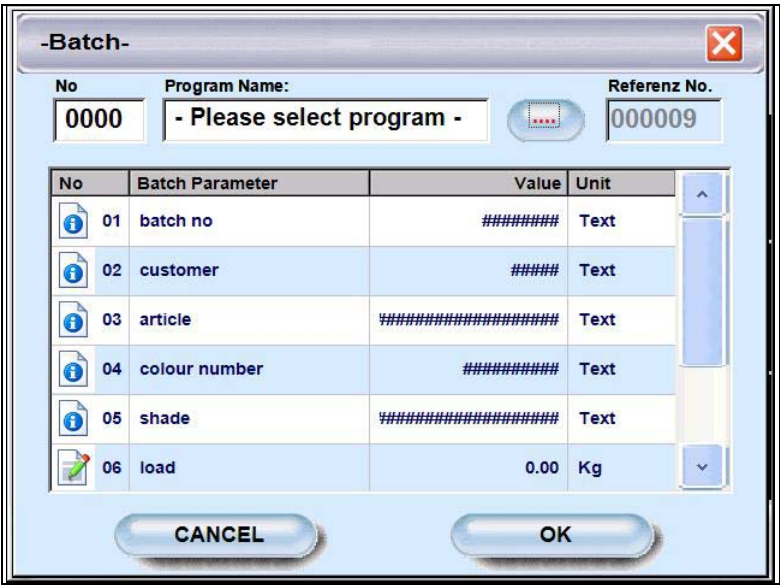
Depending on the configured program access level, the batch creation window will be opened immediately or after entering the appropriate pass-code.

Picture 10-2:
Program action
window



The creation of a new batch first assigns a new reference number on the SECOM that allows for a definite assignment of actual and historical data for this batch.

Picture 10-3: Batch
creation window



Select the desired dye program.

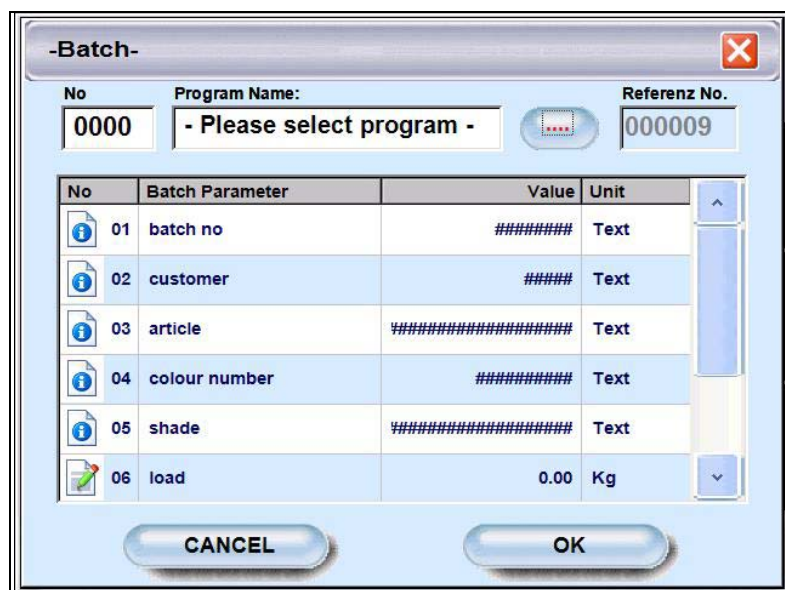
10.3 Program selection

There are two possibilities to select programs:

1. Select programs from a list of all existing programs in the SECOM.
2. Enter the program number.

10.3.1 Selection list

From the batch start creation window press the **OK** key.



The screenshot shows a window titled "-Batch-" with a close button (X) in the top right corner. It contains the following fields and a table:

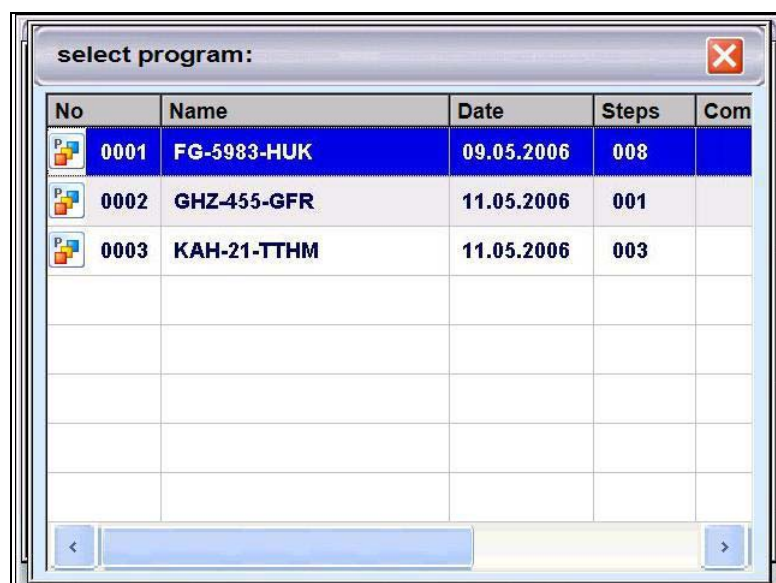
- No:** 0000
- Program Name:** - Please select program -
- Referenz No.:** 000009

No	Batch Parameter	Value	Unit
01	batch no	#####	Text
02	customer	####	Text
03	article	#####	Text
04	colour number	#####	Text
05	shade	#####	Text
06	load	0.00	Kg

At the bottom of the window are two buttons: **CANCEL** and **OK**.

Picture 10-4: Batch creation window

A window with all available programs on the SECOM will be shown.



The screenshot shows a window titled "select program:" with a close button (X) in the top right corner. It contains a table with the following data:

No	Name	Date	Steps	Com
0001	FG-5983-HUK	09.05.2006	008	
0002	GHZ-455-GFR	11.05.2006	001	
0003	KAH-21-TTHM	11.05.2006	003	

At the bottom of the window are two navigation buttons: **<** and **>**.

Picture 10-5:
Program selection list

Use the cursor keys and **OK** to select the required program.

The batch creation window is displayed again.

The program name and the program number of the selected program are shown.

Make sure that the selected program (name and program number) is the correct one and enter additional batch data. After this is done please press the **OK key** to confirm the selection and entries.

If a wrong program has been selected you can use the **OK key** again to correct your selection.

10.3.2 Entering the program number

Select the program number field by using the cursor keys and press OK. Then enter the desired program number. The controller will select the desired program.

If a program number has been entered that does not exist on the SECOM the controller will open the list of all programs, positioned on the closest match to the entered number.

10.4 Editing batch information

Depending on the machine configuration it will be possible to enter batch texts and batch parameters.

The dialog box titled "-Batch-" contains the following fields and table:

No: 0100 Program Name: FG-5983-HUK Referenz No.: 000009

No	Batch Parameter	Value	Unit
03	article	Kantakka	Text
04	colour number	12345	Text
05	shade	light blue	Text
06	load	50.00	Kg
07	length	1900.0	m
08	liquor ratio	8.0	L/Kg

Buttons: CANCEL, OK

Picture 10-6: Input of batch texts and parameters

Activate the field you want to edit with the cursor keys, followed by the **OK key**, and depending on the kind of field (alphanumeric or numerical) the keyboard or the numerical keypad will be shown.

10.4.1 Entering batch texts

For the input of batch texts an alphanumeric keypad will be displayed. The maximum number of characters will be shown. Enter the required characters as described earlier in item 4.1 Entering the program header, on page 2-27. Select with the cursor keys the "OK" field and press the **OK key** to store the text.

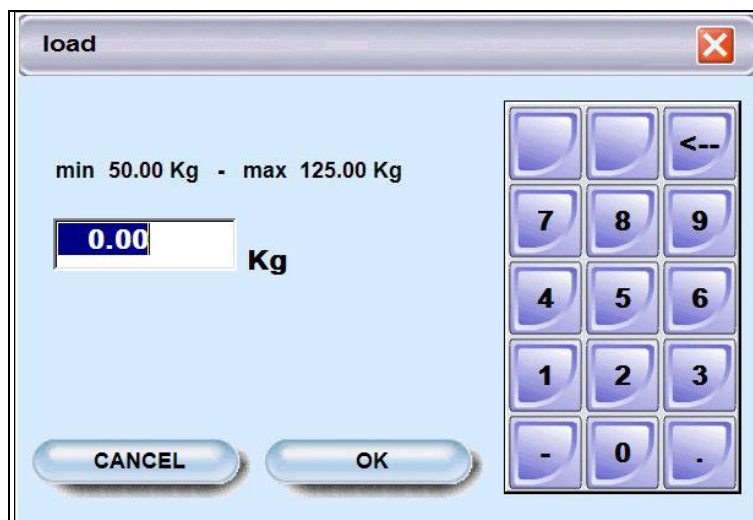
The dialog box titled "article" shows the input field for the article parameter. It includes a character count "(0..20 Characters)" and a text input area. Below the input area is an alphanumeric keypad with buttons for letters Q through Z, numbers 1 through 0, and function keys like "123", "ABC", and "abc". Navigation buttons "<" and ">" are also present. Buttons: CANCEL, OK

Picture 10-7: Input of batch texts

10.4.2 Entering batch parameters

Depending on the machine configuration it is possible to enter up to 20 batch parameters for every batch. A numerical keypad will be shown and can be used for input.

Picture 10-8: Input of batch parameters



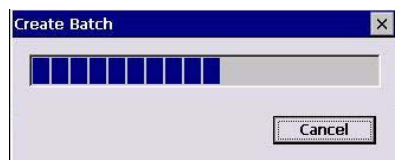
The image shows a software dialog box titled "load" with a red close button in the top right corner. Inside the dialog, the text "min 50.00 Kg - max 125.00 Kg" is displayed. Below this, there is a text input field containing "0.00" followed by the unit "Kg". To the right of the input field is a numerical keypad with buttons for digits 0-9, a decimal point, a minus sign, and a left arrow. At the bottom of the dialog are two buttons: "CANCEL" and "OK".

If the entered values are not within the tolerances specified in the machine configuration, the controller automatically uses the minimum or the maximum value respectively. Either use these values or overwrite it with a correct one.

By pressing the **OK key** the entered value will be stored.

10.5 Batch program generation

After finishing the input of all batch information data and after pressing the **OK key**, a window showing the generation of the batch program will be shown.



Picture 10-9:
Information window
during batch gene-
ration

If the program has been created on the SECOM, the main window is displayed.



Picture 10-10: Main
menu before
program start

The program number and the number of the actual step (step 1 at this point) are shown in the status line.

The batch status is set to **"READY"**. This means that a batch/program has been selected but has not been started yet.

On the left side of the window the function symbol of the first program step (start function) is shown. The right side of the window shows the program name.

The window of the step list shows the steps of the actual selected program.

10.6 Starting the program



Press the green **Start button** on the SECOM to start the program.

The batch status is set on "**RUN**" and the green LED in the start button is lit.

The program start function is processed and the program automatically advances to the next program step. All following programmed functions are processed in sequence.

10.6.1 Possible errors when starting the program

Under certain error conditions (e. g. PLC is offline or a stop alarm is active) it is not possible to start a program.

Picture 10-11:
Program start not
possible, PLC
offline



Information about alarm No 301 "PLC Offline" can be found in chapter 5, item 15.3.3 System alarms of the SECOM, on page 5-112.

Picture 10-12:
Program start not
possible, stop alarm
is active

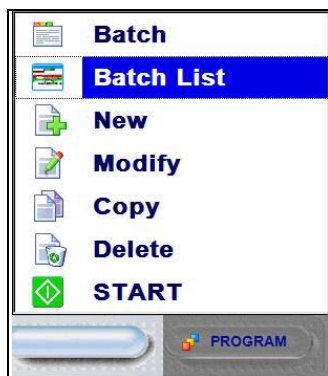


The alarm number is displayed in the status line of the SECOM. You will find a complete list of all SECOM and PLC system alarms in chapter 5. First eliminate the problem and then quit the alarm message.

As soon as there is no stop alarm active anymore the program can be started by pressing the start button again.

10.7 Batch list

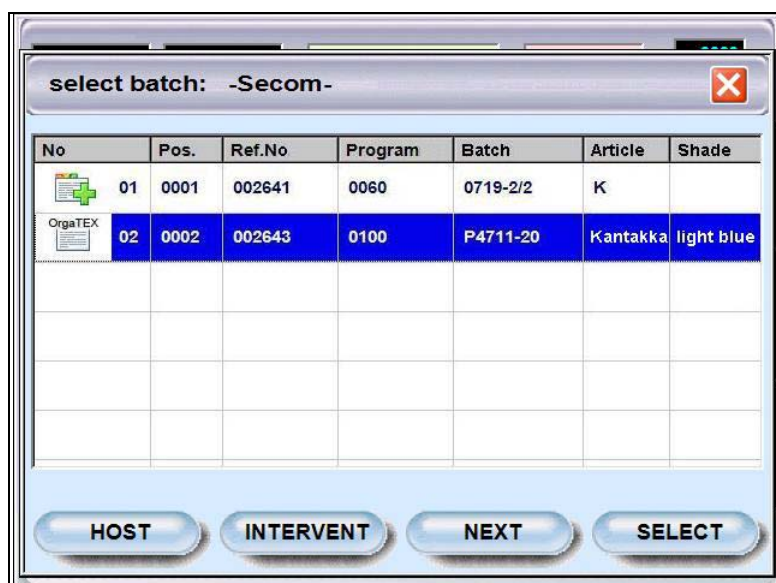
With the help of the batch list you have the possibility to schedule batches on the controller or to download batches from the central control system OrgaTEX. If the option “Batch list” is enabled please press the **F4 key**, a selection window will be shown.



Picture 10-13:
Program action
window

Select the menu item “Batch list”.

A window with the list of all available batches on the controller will be shown.



Picture 10-14: Batch
selection window

The actually active or selected batch will be shown marked by a green rectangle. In order to select or start another batch please select the corresponding line first by using the cursor keys. Then press the **OK key** or the **F4 key** to select the batch.



The window will be closed, the batch program will be created and the controller changes to the state “**READY**”. The batch can now be started by pressing the green start button.



To get additional information about the selected batch please press the **F2 function key**. A selection window will be shown.

Picture 10-15:
Selection window



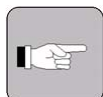
Select the menu item "Batch Info". A window with additional batch information will be shown:

Picture 10-16: Batch
information

batch info:			
	Description	Value	Unit
	Reference-No	000001	
	Program 0001	TEST	
	created	22/07/2009	14:18
	Start time	22/07/2009	14:18
	Termination time	05/08/2009	09:12
01	batch no	ABC1	
02	customer		

The window will be closed by pressing the **Esc key**. You get back to the batch selection window.

Via the selection menu additional tasks can be selected like deleting a batch or creating a new one.



The batch list is only available if the value for the system constant 6 is set to 2.

10.7.1 Loading an OrgaTEX batch

If the controller is connected to the OrgaTEX host system then it is possible via the batch list to select and load batches that were created and queued in OrgaTEX to the controller.

If the batch list is shown, please press the **F1 key**. The batch list with the scheduled batches for this machine which are enabled for download will be shown.



select batch: -Host-

No	Pos.	Ref.No	Program	Batch	Shade	
OrgaTEX	01	0001	002642	0060	0719-3/2	red
OrgaTEX	02	0002	002652	0100	2107-100	red

SECOM INTERVENT NEXT SELECT

Picture 10-17:
OrgaTEX batch list

Mark the desired batch by using the cursor keys. By pressing **F4** or the **OK key** the batch will be selected and transferred from the host system to the controller. The controller shows the status "READY" and the batch can be started by pressing the green start key.



If the desired batch cannot be found in the host batch list you can switch back to the local batch list by pressing the **F1 key**.



11 The program is running

While a program is running, the operator gets information on the current status of the process at any time.

11.1 Display status line

During a running program, the left side of the status line shows two symbols with the actual values of the process.

Picture 11-1: Status line



Normally the status line shows the actual temperature of the dyeing machine and eventually the remaining time in minutes.

What the time value represents depends on the actual running main function. It may represent hold times, delay times or operator call times, etc.

Depending on the main function of the current step it is also possible to display other symbols or actual values. However, this has to be configured by the machine supplier during the projecting works for your machine.

11.2 Display of functions

While a program is running, all active functions are displayed on the screen.

11.2.1 Display of actual values

Picture 11-2:
Display of set values



Next to the function picture, the programmed set values of each function parameter are displayed. The set values are displayed with blue characters on gray ground.

If the controller is running and the function is active, the actual values are also displayed.

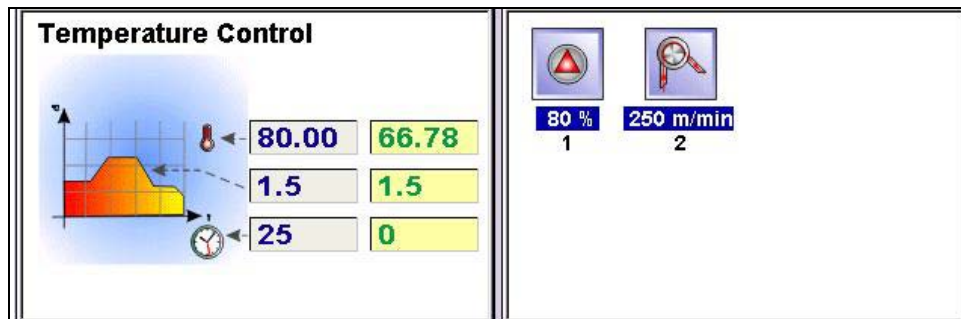
Picture 11-3:
Display of actual values



The actual values are displayed with green characters on yellow ground.

11.2.2 Main functions

The programmed main function of the current program step is displayed on the left side of the window. The information includes the function text, the function picture and the parameters (if any).



Picture 11-4:
Program running

If a function parameter includes a formula, **F=** is displayed in front of the calculated set value.

F= 560

See chapter 2 / 9 Variable function parameter.

11.2.3 Parallel functions

The active parallel functions, their function icon and their function name are displayed on the right side of the window. Depending on the machine configuration an additional set parameter value might be displayed with white characters on blue ground. The parallel function group number is displayed below this value.

Parallel functions, which have already been finished or are inactive, are displayed in light color.



Example: Function: Preparation of a tank in the dye kitchen

The function is shown as active until the preparation of the tank has been confirmed.

When the function is confirmed, the symbol and the function name are displayed in light color until the contents of the tank is transferred to the machine in a later step. If this takes place, the tank function "Preparation" is deleted.

This provides clear information on the current status of the function "Preparation" and the situation around the tank.

11.2.3.1 Display of parallel function parameters

You can get information on the programmed parameters of parallel functions at any time while a program is running.

Press the related function **number key**.

Picture 11-5:
Displaying
parameters and
actual values of
parallel functions



The function text, the function picture and the corresponding set and actual parameters (if the controller is on RUN) are displayed.

In the line underneath the icon the function set time and the actual function runtime will be shown.

Press the **Esc key** to close this window.

11.3 Manual Intervention

It is possible to modify the current program step as well as following steps of the running program with the help of the manual intervention function build into the SECOM.

The following modifications can be made:

All parameters can be changed

Functions can be deleted

Functions can be inserted

Functions can be replaced

In order to prevent that every operator is able to modify the running program with the help of the manual intervention function of the SECOM, it is possible to lock the access to the manual intervention by a pass-code.

There are three different ways to make a manual intervention and they are listed below

11.3.1 Manual intervention by pressing the hot key

While the controller is in "RUN" mode, press the "Manual Intervention" hot key. The yellow LED in the button starts blinking and the status changes to "Intervent".



Depending on the access level, the manual intervention editor can be started directly from the program menu window or after entering the appropriate pass-code.

A window will be shown where you can choose to modify main or parallel functions and their parameters or to insert, delete or exchange programs steps within the remaining steps.

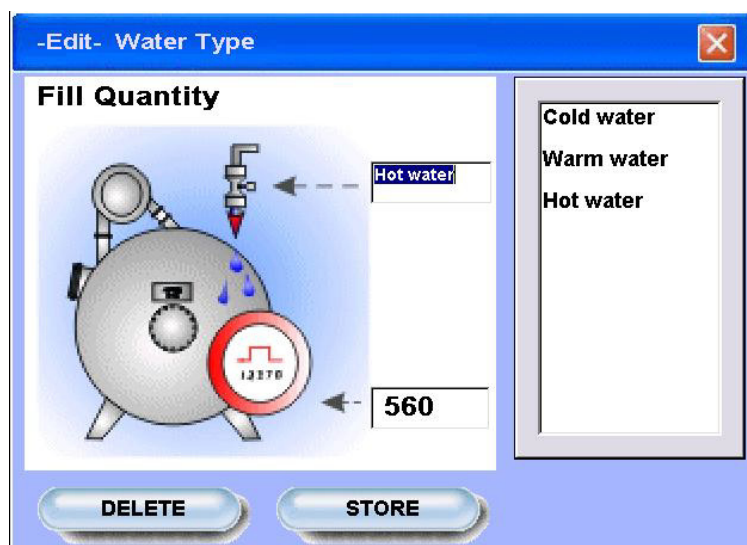


Picture 11-6: Manual intervention window

11.3.1.1 Changing the actual main function and its parameters

In order to modify the actual main function, please press the **0 key**. For the main function the following window appears.

Picture 11-7:
Function
intervention window



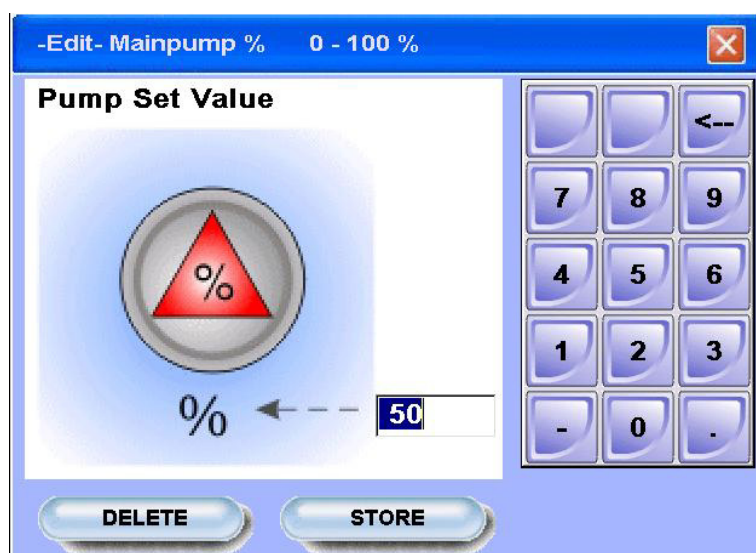
Here you can modify the function parameters by entering different numerical values and/or by selecting different text parameters. Press the **F2 key** to save the changes. You can also delete (finish) the function by using the **F1 key**. This will end the main function and after returning to automatic mode will cause the controller to go to the next (main) step.



11.3.1.2 Changing the parallel functions and their parameters

In order to modify the parallel functions, please enter the number that is shown underneath the function icon. A window as shown below appears.

Picture 11-8: Parallel
function intervention
window



Also here, you can change the parameters and store the changes or you can delete (finish) the parallel function by using the **F1 key**.

11.3.1.3 Return to the automatic mode

After all the necessary changes have been made and after pressing the **F1 key** or **F2 key** you will return to the manual intervention window. If you use the **Esc key** the controller takes over the new values and/or the finished functions and resumes the automatic operation.



The controller returns to RUN mode and the yellow LED is switched on.

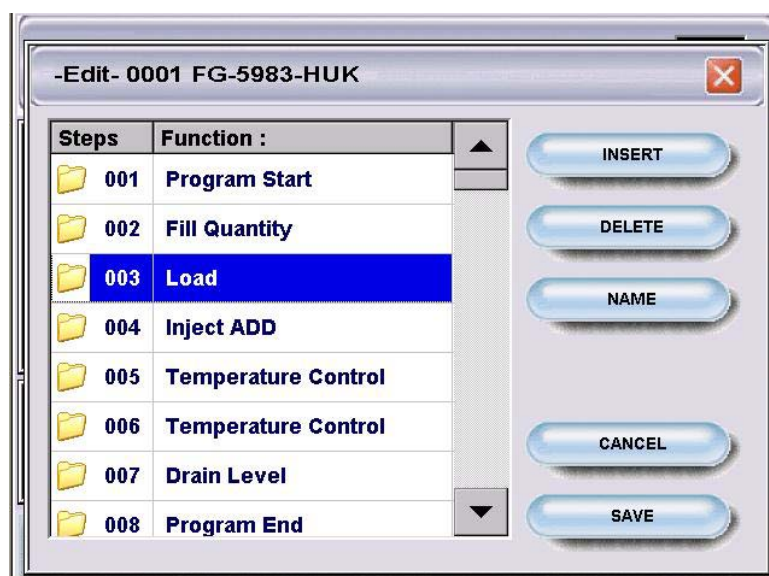
During manual intervention on the SECOM the **yellow LED** in the intervention hot key is flashing. The controller cannot advance to the next step. The actual functions of the current step are processed normally.



11.3.1.4 Changing the program steps

Via the manual intervention editor changes can be made to the active program step as well as to the following steps.

By selecting the **“List”** field or pressing the **F4 key** as shown in the Picture 11-6 a window showing all the steps of the program will be opened. The next upcoming step is marked. From there onwards all the steps and their function can be changed. It is also possible by selecting the fields **“INSERT”** and **“DELETE”** to insert new, empty steps that need to be filled with functions later or to delete complete steps with all its functions. Select the program step you want to change and do the modification as shown in chapter 2, item 5.3 Modifying a program step, on page 2 -39



Picture 11-9:
Changing program steps

If you are finished, please select the **“SAVE”** field by using the cursor and press the **OK key**, the controller stores all the changes and returns to the main window, changing the status from **“Intervent”** to **“Run”** and continues by processing the modified program.

11.3.2 Some explanations



All modifications are immediately executed while the controller is in the manual intervention mode. However, the controller will not advance to the next program step.

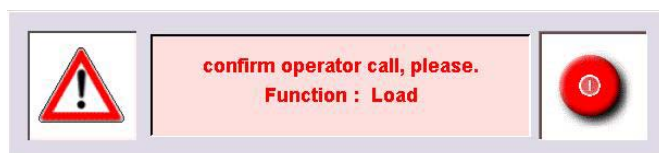
Please note that the manual interventions as described above, be it changing the actual active functions or be it adding, deleting and changing steps will in no way change the original program as stored in the controller memory or on the OrgaTEX host system.

All the changes will be effective on the batch program only. Will say that a copy of the original program that has been assigned to the batch during batch creation will be used. This program with all its eventual changes is valid until program/batch end. If logging is switched on, the actual program (including changes) will be stored together with the other logging and batch data for later reference.

Another batch, using the same program will start with the original version. So if the changes have to be permanent, then the original dye program must be modified.

11.4 Display of operator calls

When a program is processed and the controller comes to an operator call function, the window "confirm operator call, please" is displayed.



Picture 11-10:
Message "Confirm
operator call"

The message must be confirmed either by pressing the **OK key** or the **operator call key**. As long as the operator call is active, the yellow LED in the operator call key is flashing.



When the operator call has been finished please use the function **key (F3)** and the controller advances to the next program step. If the system constant 47 has been set to 1, it is also possible to go to the next step by pressing the **operator call key** (hot key). You will find more information on the system constants in the SECOM Service Manual.



11.4.1 Operator call "Sample"

The operator call "**SAMPLE**" allows either continuing the dye program or to select and start an already programmed addition treatment.

As long as the function "Sample" is active, the operator call LED and the addition LED are flashing.

After an eventually necessary addition treatment, the controller returns automatically to the "Sample" step it came from.

11.4.1.1 Sample is O.K.

Press the function **key (F3)**. A selection window is shown.



Picture 11-11: "next
step" has been
selected

Select the line "**Go to next step**" from the menu, confirm with the **OK key**.

The SECOM advances to the next program step and continues to process the program.

It is also possible to press **key operator call** (only if system constant 47 is set on 1). The controller continues with the next step.

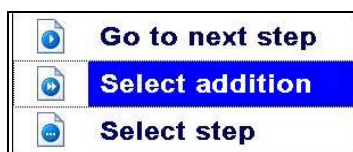


11.4.1.2 An addition is required



Picture 11-12:
"addition" has been
selected

Press the function **key (F3)**. A selection window is shown.



Select the line "**Select addition**" from the menu, press **OK** to confirm.

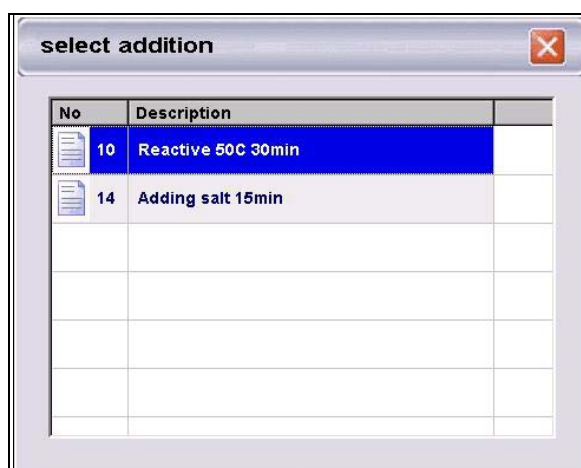
Another window is shown.



As a shortcut it is also possible to press the **addition key** (hot key) instead of F3. (only if the system constant 28 is set to "0"). The window shown in Picture 11-13 will then be displayed directly.

All programmed addition treatments are displayed.

Picture 11-13:
Selection window
for programmed
additions



Select the requested addition treatment by using the **cursor keys** and **OK**.

The controller jumps to the selected addition treatment and starts it. The yellow LED in the addition key is illuminated as long as the addition is active.

Automatic program return

After the addition treatment has been finished, the controller automatically returns to program step "**Sample**" it came from.

If no addition treatment program has been programmed the addition selection window will be empty and can be closed by using the **Esc key**.

11.4.1.3 Possible errors

If an addition is started directly and not from the program step "SAMPLE", the controller cannot return to "SAMPLE" after the addition treatment has been finished!



The controller stops the program and the alarm 327 "wrong label address" is displayed.

Solution: Confirm the alarm message. You will find information on how to display the alarm list and how to quit alarms in chapter 4, item 14.2 Alarm list, on page 4-93

Use the cursor keys to move to the corresponding program step "Sample" and press the **green start button**.

If the function "Addition end" has not been programmed the controller advances to the next program step (if available)!

After the last program step has been processed, the program status is set to END! This means that the program for the current batch **cannot** be started again!

Solution: Correct the program **immediately**!

First of all check up to which point the program has been processed!

If the program status has already been set to END, you have to **restart a new batch** with the corrected program. Press the cursor keys to move to the corresponding program step "Sample" and press the **green start button**.

11.4.1.4 Select a certain step for an addition

From the operator call "**Sample**" you can also go to any other step. The program is then processed from that step onwards. Asynchronous functions that were active at the time of sample continue to be processed.



To go to a certain program step press the function **key (F3)**. A selection window is shown.

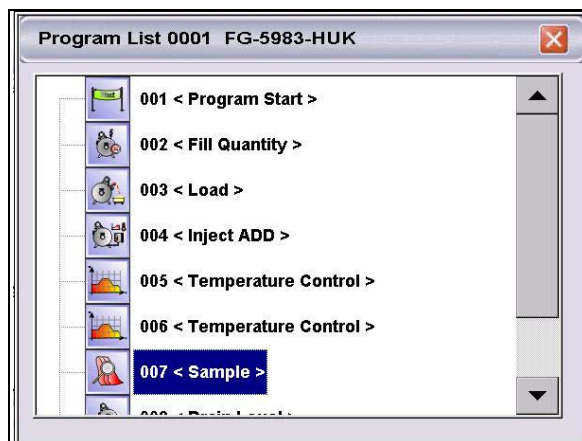
Picture 11-14: "Step selection" has been chosen



Select the menu item "Select Step", press the **OK key**.

A window with the actual dye program is shown.

Picture 11-15: Program list for the step selection



Select the desired step by using the **cursor keys** and confirm with **OK**. The controller continues the dye program on the selected step.



Such a correction of dye process is not treated or logged as an addition. The dye program will be continued from the selected step onwards. There is no jump back to any sample step. If the program reaches the program end function, the batch will be ended and cannot be started again.

11.5 Program end

As soon as the system function "**Program End**" is reached, the program status changes to "**END**".

The SECOM and all active functions are stopped.

The green LED in the start button is off.

The program for this batch **cannot** be started again.

12 Interrupting a program

The running program can be interrupted due to the following reasons:

- The red stop button on SECOM has been pressed
- A stop alarm occurs
- Power failure

12.1 Pressing the stop button

Pressing the **red stop button** causes the program running on the SECOM to be stopped.



The program status changes to "**BREAK**" and all active functions are interrupted.

If necessary, you may press the cursor keys to advance to another program step. After that you can restart the program by pressing the green **start button**.

Parallel functions that were active and not dependent on a step before the **stop button** was pressed will continue to run after the controller is restarted.

Hint: If you wish to switch off these parallel functions, move to the step "**Program Start**" and start the program from there. All active functions are reset.

Then press the **Stop button immediately** and move on to the desired program step. Continue the program by pressing the **start button**.



The start characteristics of asynchronous parallel functions can be influenced by the system constant No. 14 "Mode of asynchronous functions". Further information about system constants can be found in the Service Manual of the SECOM.

12.2 Stop-alarm

Due to failures in the process, alarms may occur which will stop the program.

The program status changes to "**BREAK**" and all active functions are stopped.

An alarm number is displayed in the status line. At the same time an alarm window displays an alarm message.

First of all, you have to quit the alarm message. Then you have to analyze the reason of the failure and to remove the problem.

If this is done press the green **start button** to start the program again.

12.3 Power failure

If a power failure occurs, the SECOM is switched off and all active functions are stopped.

After the power is restored, the controller boots again and the machine configuration is loaded. After the startup screen the main window will be shown. The program step that was active at the time of power loss, will automatically be displayed. The program status indicates **"BREAK"**.

Press the green **start button** to restart the program.

12.4 Restarting the program



To restart an interrupted program press the green **start button**.

If you restart the program on the same step it was interrupted at, a window with the following text is shown: "resume program?"

Picture 12-1:
Inquiry: "resume
program?"



There are two possibilities:



1. Press the **OK key (=yes)** to continue the program. All functions that were active when the program was interrupted are continued with the current **actual** values.

Example: A program step with a hold time of 30 minutes has been interrupted after 20 minutes runtime. After pressing the **OK key** the remaining 10 minutes are running down.

The programmed filling volume of the preparation tank is 150 liters. At the time of interruption 100 liters have already been filled. After pressing the **OK key**, the remaining quantity of 50 liters will be filled.



2. Press the **Esc key (=no)** to continue the program with the current program step and the programmed set values.

Example: A hold time of 10 minutes had been programmed. At the point of interruption 4 minutes have been elapsed. After pressing the ESC key, the complete hold time of 10 minutes is running down again.

An asynchronous parallel function in this case will also be restarted. This can lead to the situation that such a function is processed several times. The start characteristics of asynchronous parallel functions can be influenced by the system constant No. 14 "Mode of asynchronous functions". Further information about system constants can be found in the SECOM Service Manual.

Each program interruption is an exceptional situation!

The measures to be taken to continue the current process in an appropriate way depend on the failure that led to the program interruption!



Only authorized and qualified personnel only will be in a position to check the current situation and to take the necessary decision and action!

The SECOM can only provide useful information in order to resume the interrupted process!

13 Manual operation mode

With the manual operation mode the user has the option to start certain functions without having to start a program or a batch.

13.1 Conditions

The manual operation mode can only be activated under the following conditions.

1. Functions must be enabled for manual operation in the configuration.
2. The system constant No. 49 must be set to 1.
3. The controller must be in the stop mode (message **"SELECT"** or **"BREAK"** in the status line).

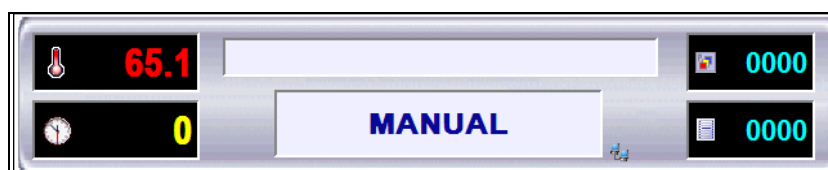
13.2 How to activate the manual operation mode?



To activate the manual operation mode, press the manual operation key in the stop mode.

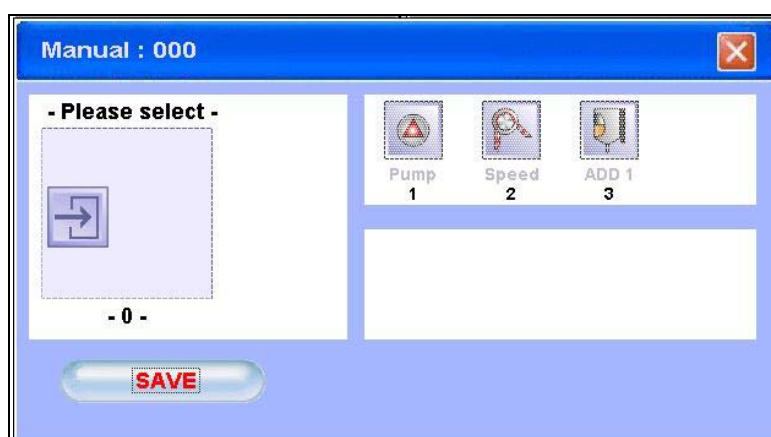
The yellow LED in the key is lit as long as the manual operation mode is active. In the status line **"MANUAL"** is displayed as controller mode. As current program step and program 0 is displayed.

Picture 13-1:
Display in the status
line during manual
operation



At the same time the selection window for the function groups that are enabled for manual operation is displayed.

Picture 13-2:
Selection window
for function groups



In order to select a main function group please select the **0 key** first and then enter the related number of the desired function group to finally select the function you wish to run. You may also select parallel functions to the main functions by selecting the empty parallel function window and by selecting the desired function(s).

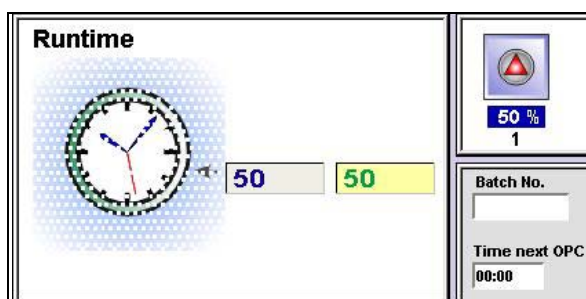
If you wish to execute parallel functions **only** (parallel track) then you can simply select a parallel function. There is no need to program an additional main function (No operation) in the manual operation mode. You will find more information on how to select functions in chapter 2, item 4.2.1 Programming main functions, on page 2-29.

After the required functions are selected and the function parameters are inserted, the manual operation for this function can be initiated by pressing the green start button. **"MANUAL RUN"** is displayed in the status line.



Picture 13-3:
Display while
manual operation
mode is active and
controller is started

While the manual operation mode is active, the functions are processed normally until the PLC program quits them. The functions that have been quit are displayed in light color.



Picture 13-4:
Display of the
finished functions
while the manual
operation mode is
active

After the controller has been started, the **actual** parameter values are shown next to the **set** parameters.

As it is not possible to run a program in the manual operation mode but single functions only, there is no function "program end" for this mode. For this reason, the controller mode does not automatically change to stop when the functions are finished. The controller has to be stopped manually by pressing the red stop button.



13.3 How to leave the manual operation mode?

The manual operation mode can only be left in the stop mode. To stop the controller, press the red stop button. When the controller is in the stop mode, you can quit the manual operation mode by pressing the manual operation key.

While the controller is in the manual operation mode, the controller can be started although a stop alarm is active.



If a stop alarm occurs after the controller has been started, it will be stopped.

Batch information

14 INFO-MENU	4-92
14.1 PROCESS INFORMATION.....	4-92
14.2 ALARM LIST.....	4-93
14.3 EVENT LIST	4-95
14.4 HISTORY	4-96
14.4.1 Batch selection	4-97
14.4.2 Display of process values	4-97
14.4.3 Copy historical batch data.....	4-100
14.4.3.1 Only one batch	4-100
14.4.3.2 All batches.....	4-101
14.5 PROGRAM LIST	4-102
14.6 BATCH INFO	4-104

14 Info-menu

Starting from the main window you can get information on the machine, the process and the current program at any time.

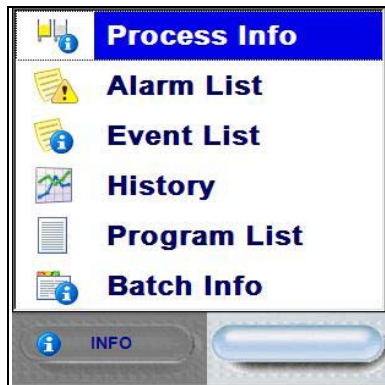


Press the **F2** key from the main window. An Info menu will be shown.

14.1 Process information

For the process information of the machine or of related equipment, like the color kitchen etc. pictures with the actual values of the running batch can be displayed (if configured accordingly).

Picture 14-1:
Info menu while a
program is running

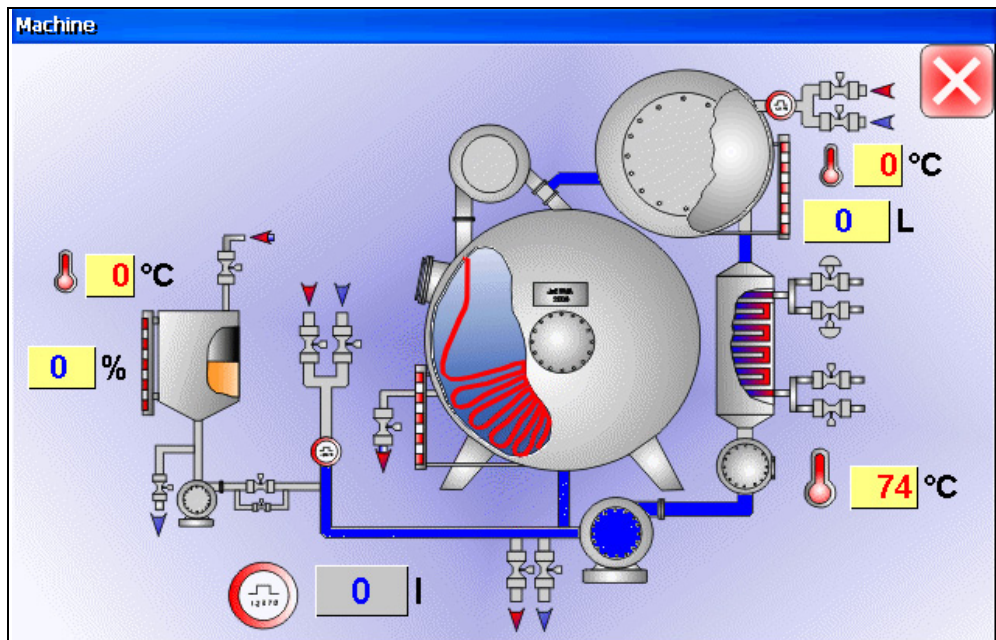


Use the cursor keys and **OK** for the selection of the menu item "**Process Info**".

The first window of the process information, normally a machine diagram, will be shown.

Picture 14-2: Process
info: Overview

Display of the
current actual values



Different analog values (temperature, speed, filling volumes, etc.) and time values can be configured during the project work for your machine according to the specific machine and the sensors available.

Different fields are available for each picture graphic to display the actual values (actual values, set values, batch texts, batch parameters and time values with their related units). The actual values are constantly updated.

Press the **Esc** key to close this window and to return to the main menu.



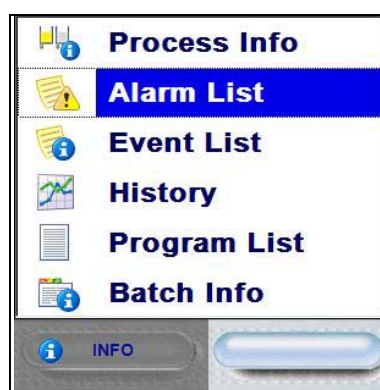
If more than one process picture has been configured there will be **action fields** in the graphics that allow changing to the other picture(s) via the **cursor keys** and the **function keys**. In the example above there is an action field (clock symbol) in the upper left corner.

14.2 Alarm list

If you want to display active alarms you have to press the **F2** key to open the info menu.



Select the menu item **"Alarm list"** by using the cursor keys and **OK**.



Picture 14-3: Alarm list has been selected

You can also press the alarm key while in the main window. The screen below will then directly be shown. The window is showing all alarms that are currently active, sorted by the start time of the alarms.



Picture 14-4: Alarm list

For every alarm an alarm number, a time stamp, the alarm text, an alarm description and an alarm icon will be shown. The alarm icon describes the reaction (STOP, HOLD, indication only).

After the reason for an alarm has been removed the alarm will automatically be reset and removed from the list.



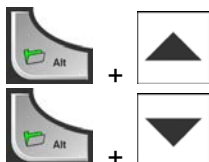
Press the **F1** key to obtain information on previously occurred alarms.

In system constant no. 002 "**max. number of alarms**" the number of displayed alarms in the history list is limited (the default value is 50).

Picture 14-5: List of historical alarms

Alarm	Date	Time	Name
011	Thu 18/05	13:54:34 - 14:13:10	Temp > 85°C
010	Thu 18/05	13:54:33 - 14:13:10	Press > 0.2 bar
010	Thu 18/05	11:47:56 - 13:54:21	Press > 0.2 bar
011	Thu 18/05	11:47:56 - 13:54:21	Temp > 85°C
010	Thu 18/05	10:56:30 - 10:56:54	Press > 0.2 bar
011	Thu 18/05	10:56:30 - 10:56:54	Temp > 85°C
006	Thu 18/05	09:18:34 - 09:22:58	Dosing pump off
006	Thu 18/05	08:48:26 - 08:51:16	Dosing pump off
006	Thu 18/05	08:44:46 - 08:45:26	Dosing pump off
010	Thu 18/05	08:27:22 - 08:27:28	Press > 0.2 bar

This list has a similar structure as the actual alarm list. Only an additional time stamp for the time the alarm was cancelled has been added.



Use the cursor keys to scroll trough the list or to scroll horizontally.

Press parallel the "**up / down**" cursor keys and the **Alt** key to scroll through the historical alarm list page by page.



Press **F1** to return to the list of current active alarms.



In order to confirm an alarm please press the (**F2**) key. The time of confirmation will be displayed.

If applicable, active system alarms are quit at the same time.

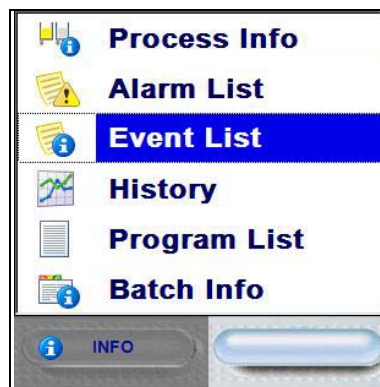


Press the **Esc** key or the **alarm** key to close the alarm list window and to return to the main window.

14.3 Event list

Next to alarms there is other vital information available that will give an overall impression about the dye process. This information for instance includes, under more, if the power was switched off, if settings were changed or if someone switched from automatic to manual mode.

Select the menu item “**Event List**”.



Picture 14-6: Event list selection

A list with events will be shown. With the default settings the last 100 events will be stored. This value can be changed via the system constant No. 65 **max No. of events** (from 50 to 10,000).

Event List		
Date	Description	
Mo 21/09 12:00:45	MEIER Login (Configuration)	
Mo 21/09 12:00:45	MUELLER Logout (Configuration)	
Mo 21/09 11:59:44	Program started	
Mo 21/09 11:59:44	Batch stopped	
Mo 21/09 11:59:30	Program selected	
Mo 21/09 11:59:06	MUELLER Login (Configuration)	
Mo 21/09 11:58:33	Alarm: 145 PLC reset ! (finished)	
Mo 21/09 11:58:31	Alarm: 145 PLC reset ! (activated)	
Mo 21/09 11:58:29	--- Login (Info)	
Mo 21/09 11:58:29	Power on	
Mo 21/09 11:56:56	Power off	

Picture 14-7: Event list display

14.4 History

For the daily work in a dye house, it becomes more and more important to record and to analyze the complete batch dyeing process. With the recorded information, the dye house staff is able to control the dyeing process and to localize reasons for off-shade dyes.

The SECOM records data of the running process permanently and provides a process protocol for each batch. With analyzing programs available on a host system and on the controller, the dyeing process can be analyzed either online or in retrospective.

The logging is done on the controller. During logging of the data, the information related to the active batch is clearly assigned. Following data will be written cyclic to the batch protocol file:

- Analog values (e. g. temperature, pressure, speed, etc.)
- Digital values (e. g. mode of valves, pump on/off, etc.)
- Active alarms
- Current machine status (start/stop, addition, etc.)

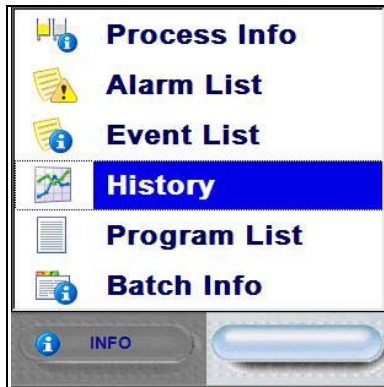
In addition to the cyclic logging, the following asynchronous information is recorded:

- Start and end of an alarm
- Start of function and end of function including function parameters
- Start of addition and end of addition
- Changes to the set values due to manual intervention
- Start of batch and end of batch, Start/Stop



To display the process values of the running batch or of a historical batch press the **F2** key.

Picture 14-8: History has been selected



Select menu item "History".

14.4.1 Batch selection

A window with the current running and the historical batches is displayed.

The number of the displayed batches depends on the configuration of the system constant no. 001 "Max. number of batches". The default value is 3).



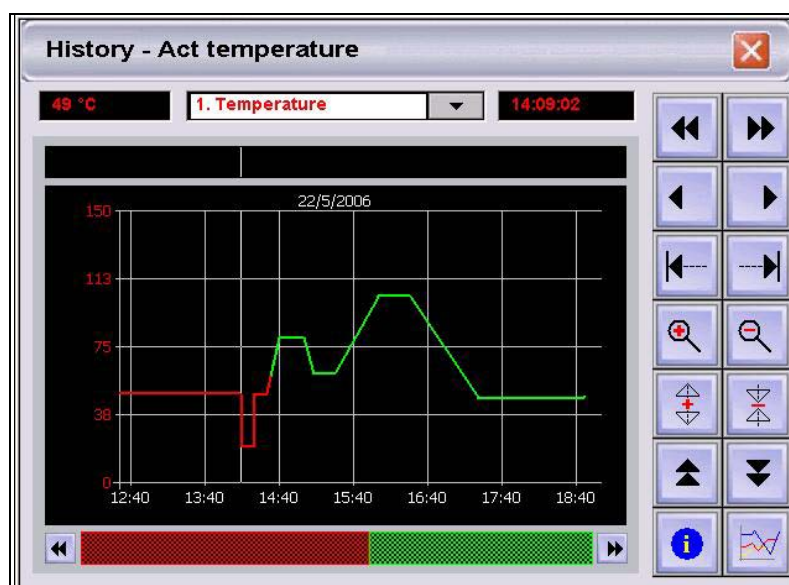
Picture 14-9: Batch selection for the display of process charts

You will find the current batch marked with a green rectangle. Select the desired batch by using the cursor keys. Confirm the selection by pressing the **F4 key**.



A window with the process values will be opened.

14.4.2 Display of process values



Picture 14-10: Display of process values

The recorded data can clearly be displayed on the SECOM on a diagram with a maximum of 20 analog values and 20 digital values. How many and which curves and diagrams are available depends on the supplier of the controller/machine.



With the help of the cursor keys and OK, press the “**left or right**” field to move the line cursor along the time axis. The values on the time axis represent the batch run time. It starts with the batch start time. As a default 6 hours are shown in one window.



By selecting the double cursor fields you can move through the time/temperature curve page by page.



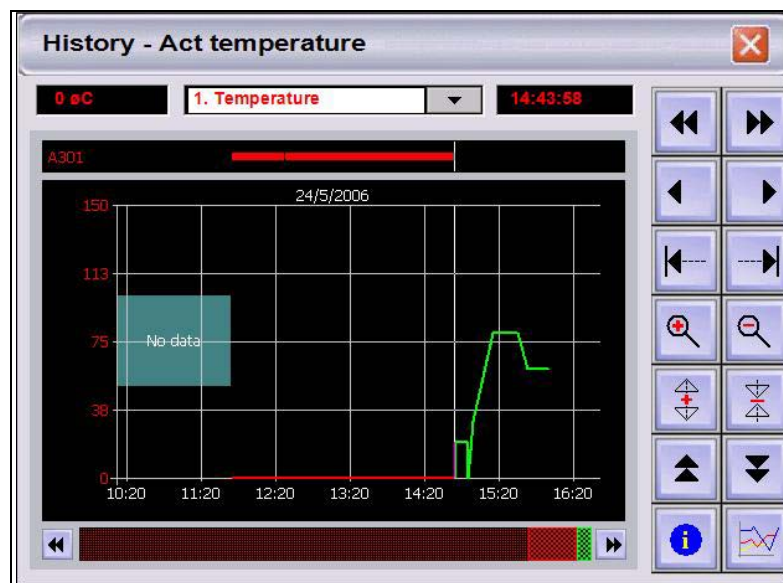
By selecting the tab fields you can move the cursor to the start and to the end of the time/temperature curve.

When moving the time cursor, the date of the actual recorded process values is displayed on top of the window (in the example shown above it is “22/05/2006”). At the right hand side next to the curve scale selection the time at the cursor position on the time axis is displayed (in the example shown above it is “14:09:02”).

For each position of the line cursor the process values recorded at that time are displayed.

If an alarm occurs during the process an additional bar is displayed. This bar is displayed as long as the alarm is active. If you move the cursor to an alarm bar, the number and eventually the description of the alarm is shown.

Picture 14-11:
Display of the
process charts



Select the zoom fields by using the cursor keys and press **OK**. With the zoom fields you can change the horizontal time scale. You can zoom in to display a minimum of 6 minutes on screen and you can zoom out to display up to 4 days.

If the SECOM is switched off and a batch has not yet been finished (this might be the case at the end of a shift) a message is shown. It says that no data is available for this time period.

If there is a white vertical line and the text “End of data” after the last data record, this means that there is no more data recorded for this batch.

For a historical batch this means that the batch was finished at that point of time. For a running batch it means that this is the last data record that has been logged.

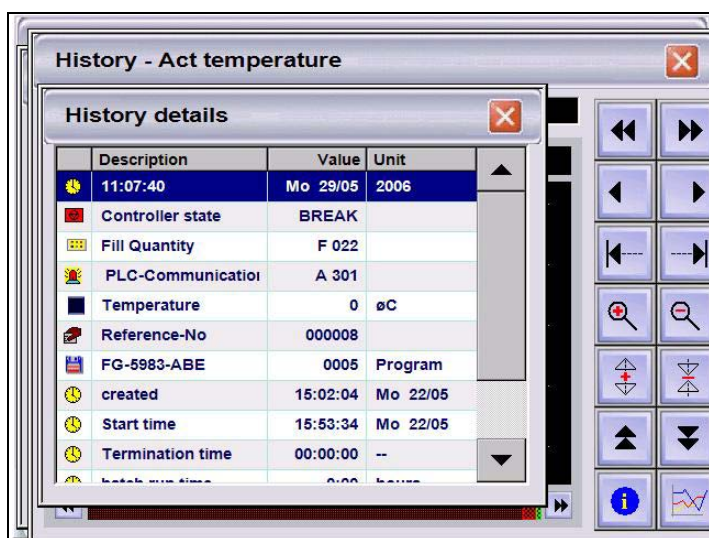
In addition to zoom into the curve horizontally the SECOM provides also the feature to spread the vertical axis. By selecting the fields shown here with the help of the cursor and the **OK key** you can zoom into the vertical axis up to 8x.



If the vertical axis is spread you can use the fields shown on the side to move the display up and down the vertical axis, so being able to investigate the time/temperature curves etc. in detail. For selection please use the cursor keys followed by the **OK key**.



Select the **"INFO"** field with the cursor and the **OK key** to get more information of the currently selected batch or to go to the actual cursor position within the curve. A window will be opened.

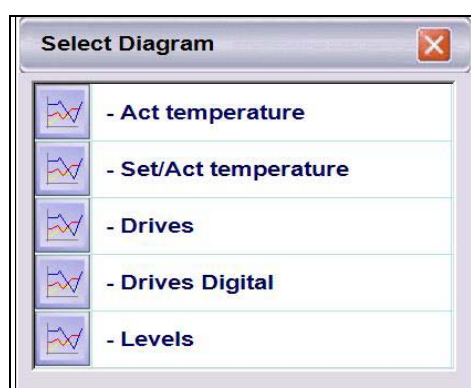


Picture 14-12: Batch information at the current cursor position

The following information is displayed:

- Date and time of the current cursor position, controller state, function, alarm (if any), temperature, batch reference number, assigned program, date of batch creation, start time, end time, batch runtime, stop time and logging cycle time.

By selecting the curve selection field with the help of the cursor and the **OK key** a menu will be opened where different diagrams can be selected. Please note that the availability of more than one diagram depends on the machine configuration and may vary from machine to machine. Also machine dependent is the data that will be shown in the additional diagrams. It may be analog values like pressure; tank levels etc, binary information like pump status (off/on), winch status etc. or a combination of both, analog and digital values.



Picture 14-13: Selection diagram

14.4.3 Copy historical batch data

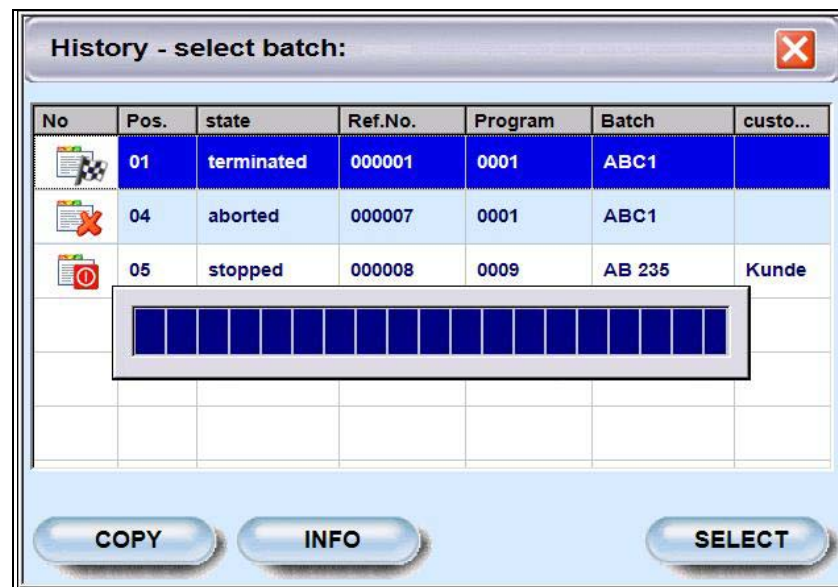
Historical batch data can be copied to a USB stick inserted into the front USB connector and can later be analyzed and printed by a computer equipped with the required software. The data can be copied for single or for all batches.

14.4.3.1 Only one batch



To copy the data press the F1 key in the "Batch selection" window (see Picture 14-9, on page 4-97).

Picture 14-14: Batch data copy menu



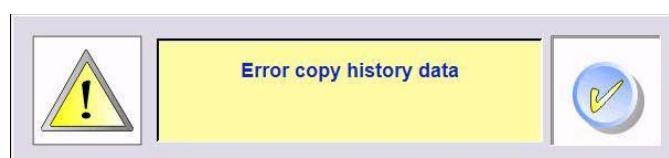
A progress bar is shown and the batch data of the selected batch is copied to the USB stick.

If there is a problem with the USB stick (either not inserted or defect/unformatted) then the following message will be shown. Press the **OK key**, eliminate the problem regarding the USB stick and try again.



Picture 14-15: USB stick not ready

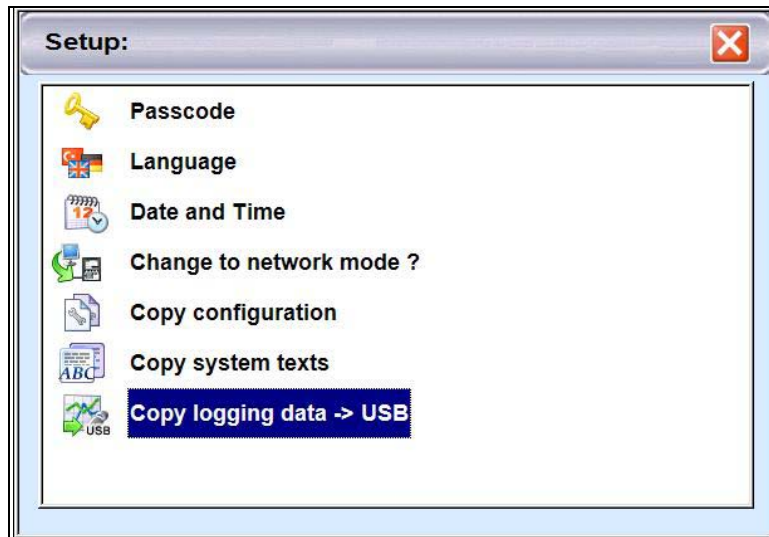
If the USB stick is out of memory, the following error message will be shown. In this case please delete unnecessary data from the stick and try the copy process again.



Picture 14-16: USB stick out of memory

14.4.3.2 All batches

In order to copy all available historical batch data to the USB stick another menu is used. From the main window please press the **F1 key**. Confirm the “**Setup**” field by using the cursor keys followed by **OK** and then the menu item “**Copy logging data -> USB**”. You can use the cursor keys and the **OK key** to select the desired menu items as well. The data of all batches is written to the directory “Reports” on the USB stick.



Picture 14-17: Batch data copy menu

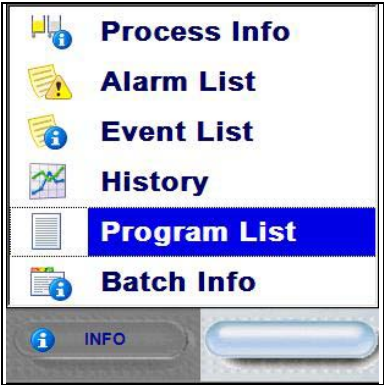
The errors and error messages that can appear during copying all batches are the same as described under section 14.4.3.1 Only one batch. The directory “Reports” will be created automatically if not available on the USB stick.

14.5 Program list



The program list is displayed after pressing the **F2 key** and selecting it from the info menu. The window shows all program steps of the running or selected program.

Picture 14-18:
Program list selected



Use the cursor keys and the **OK key** to select the menu item “**Program list**”.

All programmed steps of the current program will be shown. The step currently processed is marked with a blue line.

Picture 14-19:
Program step list

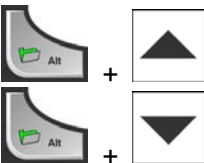
The actual active step 2 is marked

Program List 0005 FG-5983-ABE					
Step no	Description	P1	P2	P3	
001	Program Start				
002	Fill Quantity	Cold water	2000 L		
	- Pump Set Value	50 %			
	- Fill Level ADD1	Fresh water	50 %		
	- Material Flow	250 m/min			
003	Load	20 min			

Each line includes information from left to right:

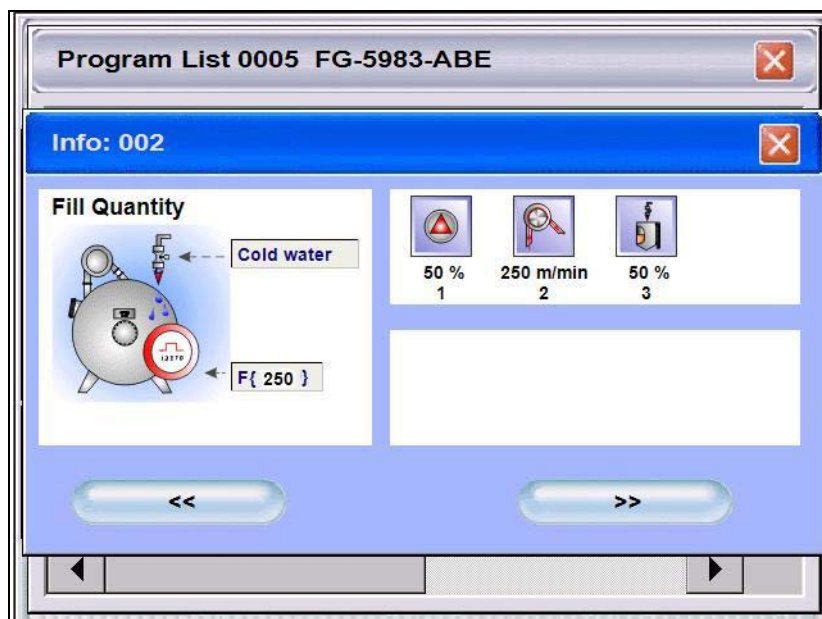
Step number, function description (main and parallel functions), function parameter and function set time.

You can use the cursor to scroll trough the program horizontally and vertically.



Use parallel the “**up or down**” cursor and the **Alt key** to scroll through the steps page by page.

You will get a complete display of all the step information after selecting the step with the cursors and pressing the **OK** key.

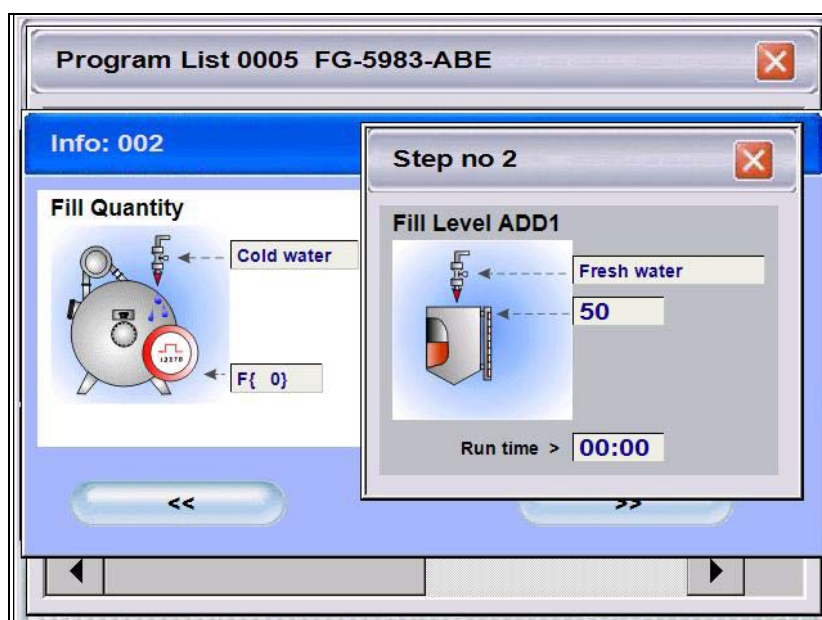
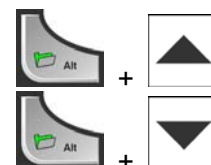


Picture 14-20: Step information

Step 2 fill quantity

Press parallel the “**up / down**” cursor keys and the **Alt** key to move to the next or to the previous program step.

Press the related number key to open a window showing the parallel function details.



Picture 14-21: Step information

Set values of parallel functions are displayed

Press the **Esc** key to return to the main window step by step.

The displayed program step information is related to the **programmed** functions. The displayed parallel functions might be different from the current running parallel function as shown in the main window as they may run asynchronous to the step they are programmed in.



14.6 Batch info



In order to display general batch related information please select “**Batch info**” from the info menu or the **F2 key**. Use the cursor keys and the **OK key**.

Picture 14-22: Batch info selection

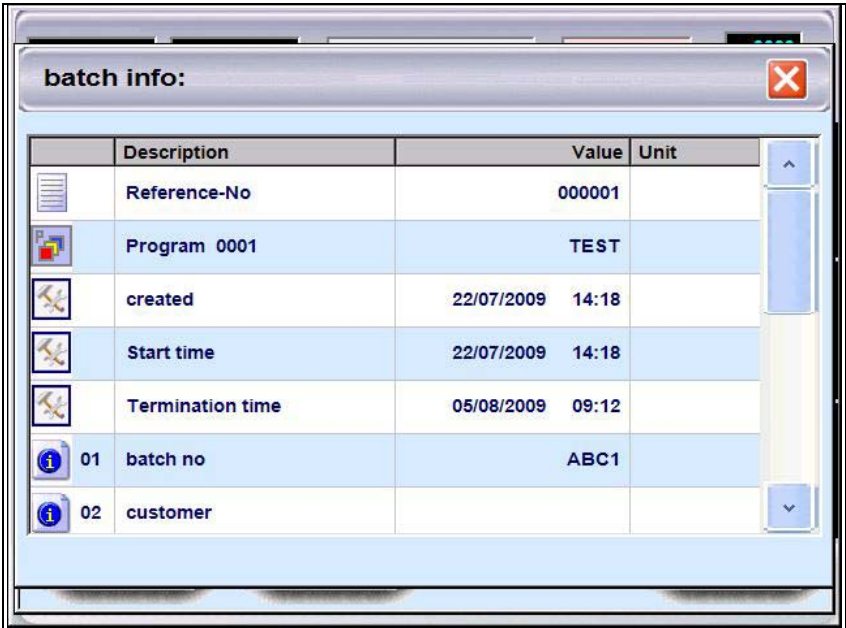


Select the menu item “**Batch info**”.

A list of batch related information like reference number, program number, batch creation, start and end time as well as batch texts and batch parameters will be shown. You can use the cursor keys to scroll through the information.

Please note that available information depends on the machine configuration and may vary from machine to machine.

Picture 14-23: Display of batch info



Messages

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15.3.3 System alarms of the SECOM.....	5-112
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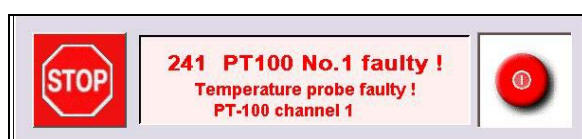
15 Alarms

Alarms are announcements and alerts for the operator. They are announcing irregularities or problems with the dyeing process, regarding the machine or with the control system.

15.1 Alarm display

If the SECOM recognizes an alarm an alarm window is opened. An alarm text is displayed in the window.

Picture 15-1: Alarm window “Stop alarm”



Picture 15-2: Alarm window “Info alarm”

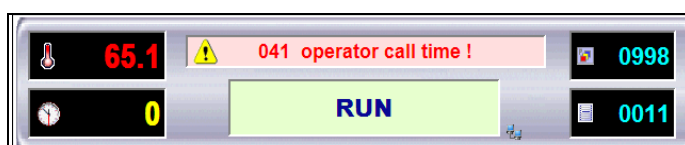


After the **OK key** or the **Alarm key** is pressed to confirm the alarm, the alarm window is closed again and the alarm confirmation time is stored.

Depending on the PLC program, the alarm window is closed automatically and the alarm message is confirmed automatically after the reason for the alarm has been removed.

If an alarm appears then next to the alarm window the alarm number will be displayed in the status line.

Picture 15-3: Status line during active alarm



If more than one are active at the same time, the alarm number with the highest priority will be shown in the status line followed by the total number of active alarms.

Picture 15-4: Status line with more than one alarm



Depending on the machine configuration, an alarm can have different effects on the running program.

There are three alarm effects on a running process:

- STOP** ⇒ The running program will be stopped and must be started again with the green start key after the reason for the alarm is removed.
- INFO** ⇒ The occurring alarm does not have any effect on the running program. This kind of alarm gives a hint to the operator that there is an irregularity within the process.
- HOLD** ⇒ The advance to next step function is locked in the running program. The status of the controller (display in status line 2) changes to "HOLD". The alarm number is displayed in the status line 1 and the green LED on the start key is flashing.

By pressing the **OK key** the user confirms that he has noticed the alarm. However, the alarm is still active. The displayed alarm number in the status line also shows this.

Only after the reason for the alarm is eliminated, the alarm indication will be cleared!

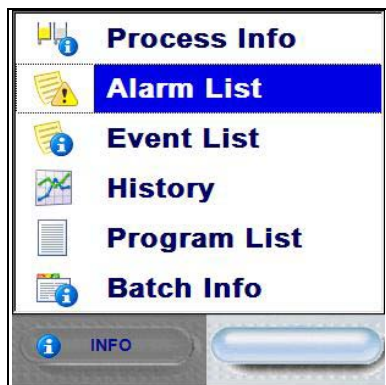


15.1.1 Alarm list



You can display the alarm list, which contains all current active alarms after pressing the **F2 key**.

Picture 15-5: Alarm list selected

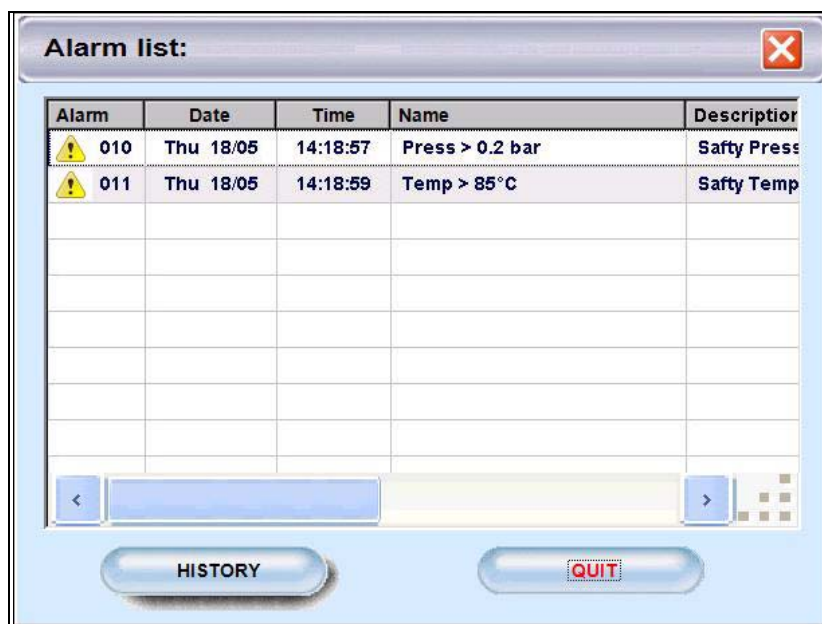


Use the cursor keys and the **OK** key to select the menu item **"Alarm list"**.



Alternatively you can also press the alarm key while in the main window. The window below is opened directly showing the active alarms sorted by the alarm time.

Picture 15-6: Alarm list



For every alarm the alarm number, the timestamp when the alarm appeared, the alarm text, the alarm description as well as an alarm icon will be shown. The alarm icon describes the reaction (STOP, HOLD, indication only).

After the reason for the alarm is eliminated, the alarm will be deleted from the list above.

Press the **F1 key** to display the machine alarms that occurred earlier.



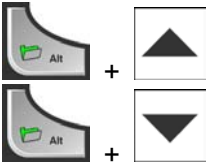
The number of displayed alarms depends on the configuration of the system constant no. 002 "max. number of alarms" (the default value is 50).



Picture 15-7: List of historical alarms

This list is very similar to the actual alarm list, except that a time stamp for the alarm end will be shown additionally.

Press parallel the “**up / down**” cursor keys and the **Alt key** to scroll through the list of historical alarms.



Press the **F1 key** to go back to the actual alarms.



In order to confirm an alarm please press the **F2 key**. The time of confirmation will be displayed.



If applicable, active system alarms are quit at the same time.

Press the **Esc key** to leave the alarm window.



15.2 Starting the controller after alarms occurred

15.2.1 Start the controller after a stop alarm

In order to restart the controller after a stop alarm occurred, you must confirm the alarm message on the display by pressing the **OK key**.

If this is done, you must eliminate the alarm reason.

You will find more information on alarms and how to remove them in this chapter item 15.3.3 System alarms of the SECOM, from page 5-112 onwards.

The alarm number is displayed in the status line. You can restart the controller by pressing the start key after the alarm reason has been eliminated.

15.2.2 Start the controller after a hold alarm

To restart the controller after a hold alarm occurred you must confirm the alarm message on the display by pressing the **OK key**.

If this is done you must eliminate the alarm reason.

You will find more information on alarms and how to remove them in this chapter 5 item 15.3.3 System alarms of the SECOM, from page 5-112 onwards.



The alarm number is displayed in the status line. After the alarm reason is eliminated open the alarm list by pressing the **alarm key** or by selecting menu item "Alarm list" (**function key F2**) in the info menu.



When the alarm list is displayed, press the function key **F2 (QUIT)**. The controller mode changes to **"RUN"** and the green LED on the start key is on.

15.3 Alarm classification

A total of 400 alarms are available on the SECOM. They are classified as follows:

- User alarms (No. 001 - 100)
- System alarms PLC (No. 101 - 150)
- Controller and measurement alarms (No. 151 - 300)
- System alarms SECOM (No. 301 - 400)

15.3.1 User alarms

Depending on the machine, up to 100 different alarms can be configured by your supplier during the project work. The alarm text and the effect of the alarms can be set up in the configuration.

Example: Fabric flow problem / overload winch drive
 Dye kitchen tank not ready
 Level sensor defective

You should find a list of your specific user alarms in your suppliers' machine documentation.

15.3.2 Controller and measurement system alarms

The control and analog process routines of the connected PLC transfer alarms to the SECOM when errors occur in the control loops and the analog channels.

Example: Gradient alarms (temperature control dye machine)
 Measurement system failures (dosing ADD 1)
 PT100 channel 2 defective

You should find a list of your specific controller and measurement system alarms in your suppliers' machine documentation.

15.3.3 System alarms of the SECOM

System alarms of the SECOM are generated if the software of the controller discovers problems, which are not directly related to the dyeing process. The SECOM distinguished between software and hardware problems.

Examples: Communication error to PLC
 Wrong type of configuration

You will find a complete list of all system alarms below.

Alarm-No.	Description	Reaction	Alarm group
301	no communication between SECOM controller and PLC reasons: - PLC is switched off - faulty cable connection - Arcnet terminator is not connected remedy: - check and exchange cabling - check Arcnet terminators	STOP	10
302	PLC has been exchanged remedy: - will be reset automatically after the PLC has been initialized	STOP	10
303	battery of the CPU is empty remedy: - exchange battery	DISPLAY	10
308	the PLC does not have the required system software, no program execution possible remedy: - exchange PLC system software	STOP	10
309	the PLC does not have the required system software, program execution possible, but not all features supported remedy: - exchange PLC system software	DISPLAY	10
310	the PLC is not equipped with the PLC boards that are configured in the machine configuration. remedy: - check boards in the PLC or - adapt the machine configuration to the actual equipment	DISPLAY	10
311	the type configuration is not correct or has the wrong structure. remedy: - transfer a correct type configuration	STOP	10

Alarm-No.	Description	Reaction	Alarm group
312	the machine configuration is not correct or has the wrong structure. remedy: - transfer a correct machine configuration	STOP	
313	Wrong PLC type connected that is not supported by the controller remedy: - connect a different PLC	STOP	
320	The PLC memory can't be initialized or the control parameter (machine constants, timers etc.) can't be transferred to the PLC. remedy: - check the machine configuration	STOP	10
321	incorrect dye program remedy: - acknowledge the alarm in the alarm list - change the dye program - create a new batch with the correct program	STOP	10
322	dye program does not correspond to the configuration remedy: - acknowledge the alarm in the alarm list - change the dye program - create a new batch with the correct program	STOP	10
323	the executable dye program is incorrect. remedy: - acknowledge the alarm in the alarm list - create and start a new batch	STOP	10
324	a program step can't be downloaded to the PLC. remedy: - acknowledge the alarm in the alarm list - restart the program on the same step	STOP	10
325	invalid controller state in the program execution of the SECOM controller remedy: - will be reset automatically by the controller	STOP	10

Alarm-No.	Description	Reaction	Alarm group
326	<p>power fail during the step change, the program step hasn't been activated in the PLC</p> <p>remedy:</p> <ul style="list-style-type: none"> - acknowledge the alarm in the alarm list - restart the program on the same step 	STOP	10
327	<p>error during return from an addition routine, wrong return address</p> <p>remedy:</p> <ul style="list-style-type: none"> - acknowledge the alarm in the alarm list - restart the program on the desired step 	STOP	10
328	<p>error during calculation of a parameter formula, formula is wrong</p> <p>reasons:</p> <ul style="list-style-type: none"> - wrong formula - wrong values (for example machine constants are not set) <p>remedy:</p> <ul style="list-style-type: none"> - acknowledge the alarm in the alarm list - check used values and correct formula if necessary - start batch on another step or create and start a new batch 	STOP	10
329	<p>error during calculation of a function set time formula, formula is wrong</p> <p>reasons:</p> <ul style="list-style-type: none"> - wrong formula - wrong values (for example machine constants are not set) <p>remedy:</p> <ul style="list-style-type: none"> - acknowledge the alarm in the alarm list - check used values and correct formula if necessary 	DISPLAY	10
330	<p>problem in accessing the file server directories</p> <p>remedy:</p> <ul style="list-style-type: none"> - check the connection to the file server (cables, cards) - check that the directories are available and if the access right for the controller are set correctly <p>The controller cyclical tests this access. If the reason for the alarm has been removed the alarm will be reset automatically</p>	DISPLAY	10

Alarm-No.	Description	Reaction	Alarm group
331	not enough disk space for data logging. The logging will be interrupted until enough space is available. remedy: - delete old batches - The alarm is reset automatically, if enough disk space is available.	DISPLAY	10
332	parameter can't be transferred to the PLC. remedy: - acknowledge the alarm in the alarm list - start batch once again - correct configuration if necessary	STOP	10
333	parameter can't be saved in a program. remedy: - acknowledge the alarm in the alarm list - please check program memory and configuration - start batch once again	STOP	10
334	parameter can't be saved in a program. remedy: - acknowledge the alarm in the alarm list - please check program memory and configuration - start batch once again	STOP	10
335	batch can't be started remedy: - acknowledge the alarm in the alarm list - start batch once again	STOP	10
336	not enough disk space on the ram disk, the error log protocol will be interrupted until enough space will be available remedy: - please check, if there is an error log file ERROR.LOG on the RAM disk. If yes, than copy this file to a memory card and give the information to SETEX. - after that reboot the controller. The ram disk will be deleted automatically.	DISPLAY	10

Alarm-No.	Description	Reaction	Alarm group
337	error reading the configuration error reading one of the configuration data records remedy: - Check the configuration with the Typeconf Tool and correct it if necessary	STOP	10
338	Not enough memory to store the status information remedy: Finish batch normally, delete batch data. Check if alarm 330 exists and correct if necessary	DISPLAY	10
339	Warning! Batch change not possible! Changing the log file after the set log time could not be performed	DISPLAY	10
340	error reading/transferring module parameters remedy: - Check placement/modules and correct if necessary	DISPLAY	10

15.3.4 System alarms of the PLC

The SECOM announces errors of the connected PLC. The SECOM distinguishes between system alarm of the software and hardware installed on the PLC.

Examples: Communication problem to PLC
 Battery PLC empty

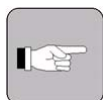
You will find a complete list of all system alarms of the PLC below.

Alarm-No.	Description	Reaction	Alarm group
101	Communication problem between controller and PLC, e.g.: - defective cable Remedy : - check and repair cable connection	STOP	10
102	Fault in communication to the analog board. No analog processing possible. No calibration data available. Remedy : - exchange analog board	STOP	10
103	Power fail > 2 sec. (cold start) occurred while the controller was on "RUN". Remedy : - is automatically reset after the controller recognizes the alarm.	STOP	10
104	Faulty instruction list. Remedy: - switch off PLC and restart. If this is not successful, the PLC program has to be transferred again from the programming station into the PLC.	STOP	10
105	Faulty placement of cards/modules During the instruction list processing a board was not recognized or not found. Remedy : - switch off PLC and restart - if necessary exchange boards	STOP	10
106	Timeout of the PLC program The PLC program exceeded the max. cycle/run time (e.g. by an infinite loop). Remedy : - check the PLC program and correct it	STOP	10
107	Battery empty Remedy : - insert a new battery.	DISPLAY	10

Alarm-No.	Description	Reaction	Alarm group
108	Problem when burning the EEPROM Remedy : - burn EEPROM again	DISPLAY	10
109	Faulty function number on step download Remedy : - check and correct controller - configuration	STOP	10
110	Faulty parameter number on step download Remedy : - check and correct controller - configuration	STOP	10
111	communication error module 1	DISPLAY	10
112	communication error module 2	DISPLAY	10
113	communication error module 3	DISPLAY	10
114	communication error module 4	DISPLAY	10
115	communication error module 5	DISPLAY	10
116	communication error module 6	DISPLAY	10
117	communication error module 7	DISPLAY	10
118	communication error module 8	DISPLAY	10
119	communication error module 9	DISPLAY	10
120	communication error module 10	DISPLAY	10
121	communication error module 11	DISPLAY	10
122	communication error module 12	DISPLAY	10
123	communication error module 13	DISPLAY	10
124	communication error module 14	DISPLAY	10

Alarm-No.	Description	Reaction	Alarm group
125	communication error module 15	DISPLAY	10
126	communication error module 16	DISPLAY	10
127	communication error module 17	DISPLAY	10
128	communication error module 18	DISPLAY	10
129	communication error module 19	DISPLAY	10
130	communication error module 20	DISPLAY	10
131	communication error module 21	DISPLAY	10
132	communication error module 22	DISPLAY	10
133	communication error module 23	DISPLAY	10
134	communication error module 24	DISPLAY	10
135	communication error module 25	DISPLAY	10
136	communication error module 26	DISPLAY	10
137	communication error module 27	DISPLAY	10
138	communication error module 28	DISPLAY	10
139	communication error module 29	DISPLAY	10
140	communication error module 30	DISPLAY	10
141	communication error module 31	DISPLAY	10
142	communication error module 32	DISPLAY	10

Alarm-No.	Description	Reaction	Alarm group
143	<p>Wrong PLC placement</p> <p>The alarm will be set if in the PLC placement a difference between plcid and SecomId appears.</p> <p>Please check if all modules are switched on or inserted correctly. Eventually adapt the placement on the controller.</p>	DISPLAY	10
144	<p>Faulty controller configuration in the PLC</p> <p>The alarm will be set if in the PLC placement a difference between CoDeSysId and the SecomId appears.</p> <p>Adapt the placement on the controller</p>	DISPLAY	10
145	<p>PLC was new initialized (short power drop)</p> <p>Remedy:</p> <ul style="list-style-type: none"> - will be reset automatically if the controller recognized the alarm. 	DISPLAY	10



You will find a description of how to display and to quit alarms in item 15.1.1 Alarm list, on page 5-108.

